GRUMMAN
plane news
Vol. 32, No. 4, Bethpage, N. Y., February 23, 1973

GDS: a unique blend of people and product ingenuity

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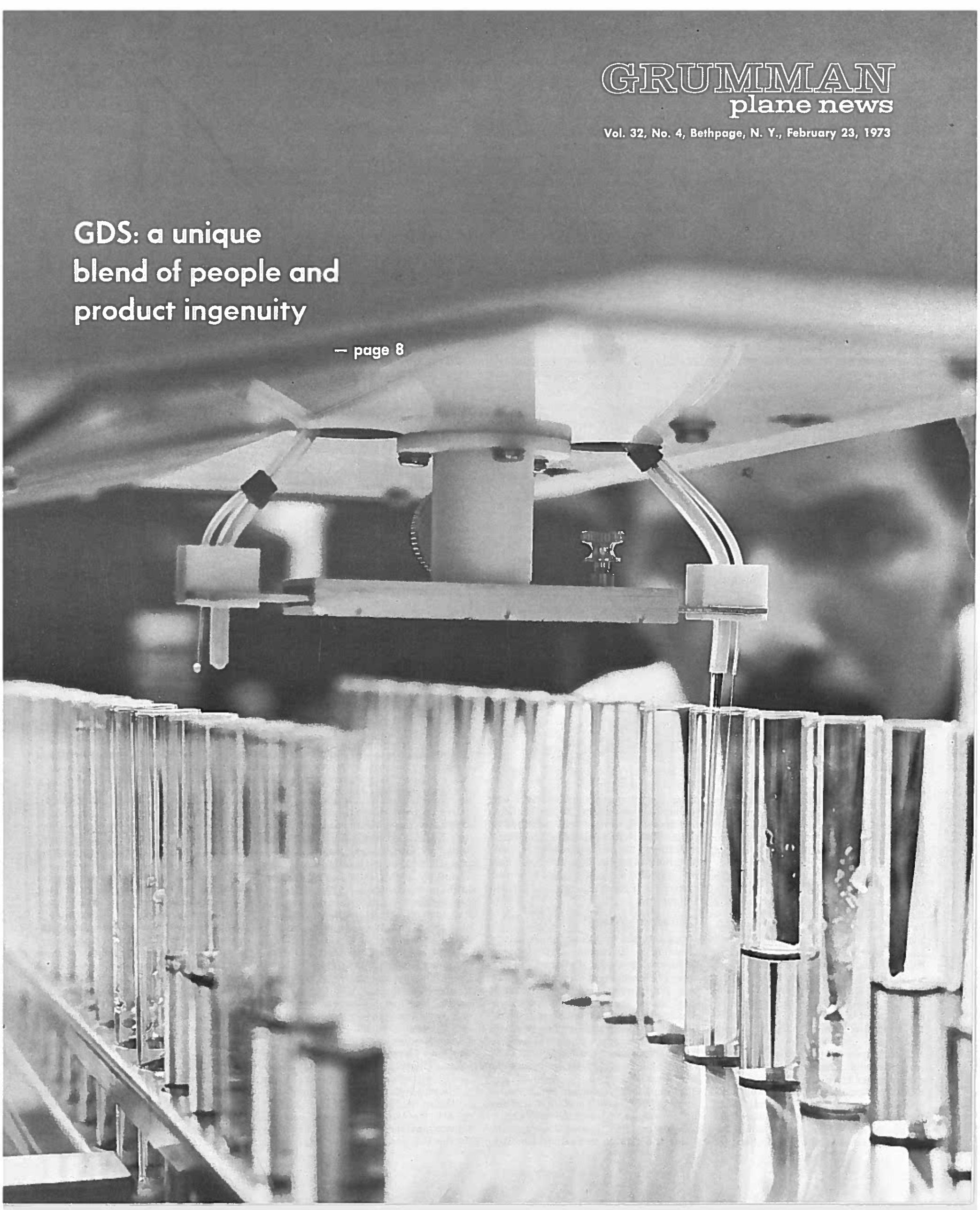

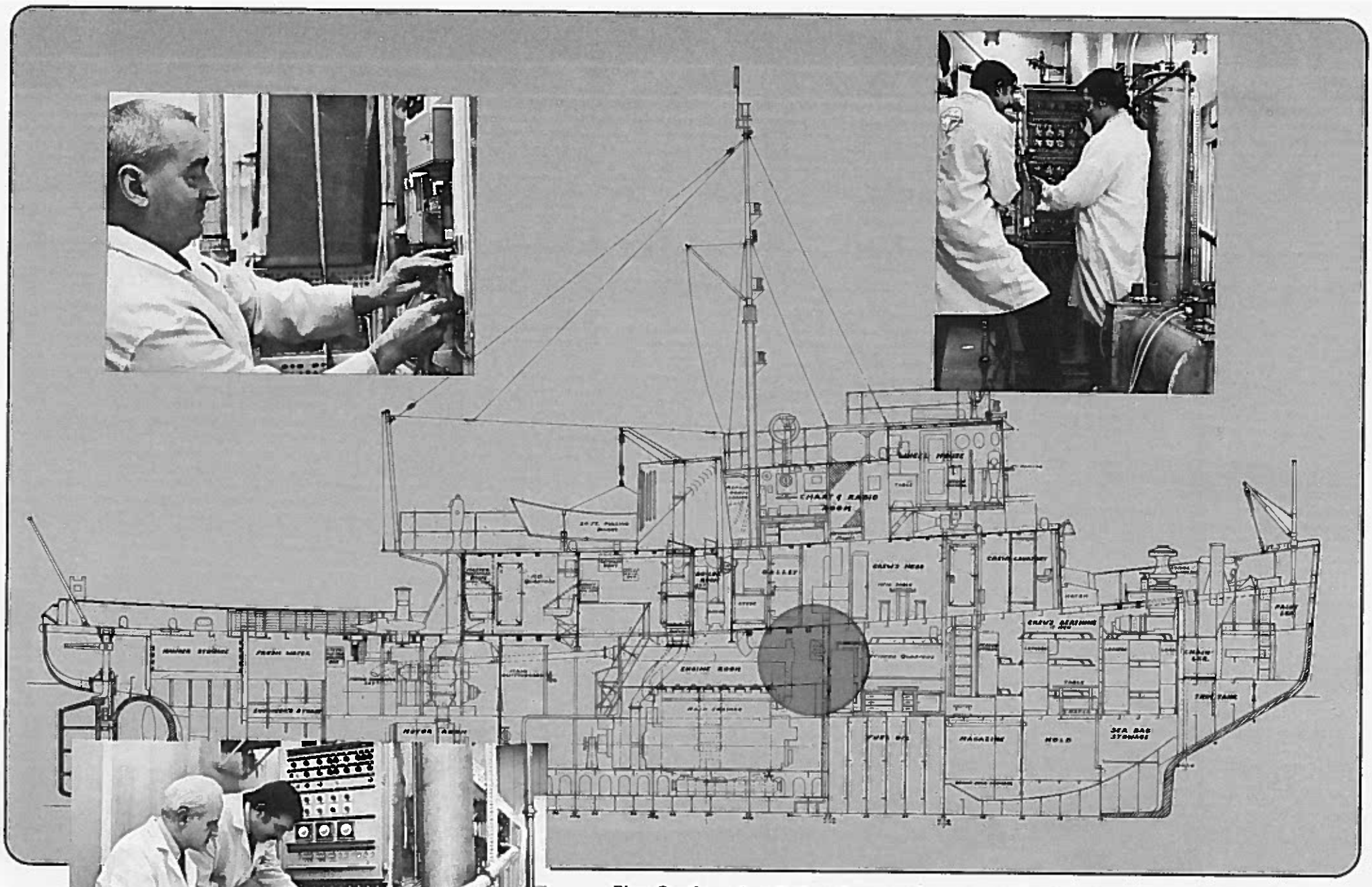

First Ozotherm installation (location shown in circular area) will be on USCG Manitou.

Versatile Waste-treatment System Designed for Present, Future Needs

Photos by Fred Annette

Winter hits like a frigid explosion in northern Alaska. Subzero temperatures whipped by fierce storms create chill factors as low as -100° F. The ground is a rigid block of ice distinguished from the frozen sea only by markers imbedded along the shoreline. In summer, the pale arctic sun merely circles the earth in a kind of perpetual daylight, melting the top two feet of earth, leaving a swamp on top and below, a loose association of vegetation, gravel, sand, and ice, all frozen together. There are no trees or underbrush to hide anything; tracks left by government vehicles during World War II may still be visible. Hardly anything decays or disappears; and in most areas certain matters like the disposal of human wastes are major problems.

Less extreme, but similar in many respects to the Alaskan isolation, is life aboard seagoing vessels that must tackle most of the problems and needs of landbound communities. Built-in waste treatment facilities on most ships treat sewage to some degree, then dump the residue overboard. But limitations of space and other complications have long precluded the building of conventional biological waste-treatment facilities on ships. And with population increases, migrations to the hinterlands, and mounting waterborne traffic, the need for efficient, compact waste-treatment systems is becoming a pressing ecological concern.

Ozotherm system

One solution for shipboard use may be Grumman's Advanced Civil Systems' Ozotherm System. Designed to remove 90 percent of the contaminants from liquid wastes and convert solids to inert ashes, the Ozotherm functions in any environment—including salt, brackish, and fresh water—and is versatile enough to ultimately find broad applications ranging from the Alaskan oil fields to seagoing vessels to trailer camps and recreation areas.

"The main advantage of the system is its simplicity," says Vin Rau of Business Development. "It combines both chemical and physical operations, separates solids and liquids, and removes most of the contaminants in the process. It requires no chemical additives and is one of the few waste-treatment systems that uses ozone, a powerful disinfectant generated by electrical corona.

In addition, the system is compact, easy to operate, highly reliable, and requires little maintenance. All told, the unit can be made to fit into a tight space, like that on a ship, or it can even be used as a portable unit with its own power supply."

Grumman's first contract calls for designing, constructing, and installing one prototype system for a six-month trial on the 20-man U.S. Coast Guard cutter, Manitou. Grumman is not the only firm awarded a contract under this program, though. One competitor, Lundy Electronics, is developing a system for a 50-man vessel, while still another, Thiokol, is constructing a disposal system for a 20-man vessel using a different technique from Grumman's.

"Under the 1970 Federal Water Quality Act, the U.S. Coast Guard was designated as the enforcement authority for the U.S. coastal waters," explains Al Munier, director of Advanced Civil Systems. "Basically, the act is designed to get ships to stop dumping wastes overboard, so the Coast Guard understandably is beginning its clean-up program with its own ships."

There are several techniques for handling wastes that ships can employ, he continues. One is a recirculating waste-treatment system which actually treats and recycles sewage water. Another is a holding tank from which sewage can be discharged at a shore facility. Still another is a flow-through waste-treatment type like the Ozotherm system. While the Coast Guard regulations have not yet been completed, Munier points out, the options are still open for shipbuilders to select the system which does the best job for them.

Meets any standard

"Whatever the Coast Guard's ultimate requirements happen to be," he says, "we feel our Ozotherm system is versatile enough to meet any standards. For example, if the Coast Guard decides

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Grumman, three other firms, compete for NASA space tug

Grumman Aerospace is in the competition for development of a "space tug" for the National Aeronautics and Space Administration.

The Company is to receive a 10-month contract of about $750,000. A like amount will go to each of the other three competitors, Martin Marietta, McDonnell Douglas, and General Dynamics. The awards were made by NASA's Marshall Space Flight Center and constitute the first part of a three-phase design competition. Funding will come from NASA and the Department of Defense.

The feasibility study-competitions have been set up so that two companies will vie for a storable fuel version of the tug and the other two will compete for a cryogenic system. Grumman is in direct competition with Martin Marietta for a storable fuels concept—that is, fuels like those used in the Lunar Module. The other two companies are to study cryogenic fuel, such as liquid nitrogen. The cryogenic fuels powered the Saturn rockets.

The cryogenic fuels are said to be the most efficient—but they require much more space. The Company feels that the storable fuel route is best. Not only that, Grumman has had first-hand, proven experience with them on LM.

As envisioned today, the tug's mission will be to deploy or retrieve payloads (satellites) in orbit some 20,000 miles from earth. The tug and the payload at launch will be enclosed in a Space Shuttle Orbiter that is planned to orbit at an altitude of from 150 to 200 miles from earth. The Orbiter will deploy the tug and its payload, and then the tug will carry the payload to its high position in space. That done, the tug will go "down" to dock with the Shuttle, which will return it to earth.

The tug is to be capable of making some 20 such round trips and, in all probability, will be used on 50 percent or more of the Shuttle missions.

Plane talk. Rep. Otis Pike (L), who flew in back seat of Tomcat with Chief Test Pilot Chuck Sewell, describes his flight at Calverton to Vice President Jack Rettaliata and Sewell (R). Pike termed Tomcat 'just incredible' during takeoff.

Ready Tiger for 'first flight' at Calverton facility. (Photo by Dick Sander)

Tiger flying again at Calverton

They turned back the clock at Calverton a couple of weeks back, and all it took to turn the trick was a nifty jet fighter, all decked out in a dazzling white paint job . . . and a long memory. For some of the flight test crew there, it must have seemed like the mid-50s watching the sleek F-11 Tiger darting about the skies. (And looking back, were those days **really** as sleepy as they now seem?)

Two of the F-11s — old Blue Angel aerobatic veterans—were recently delivered to Calverton by the Navy to be refurbished, instrumented, and modified to investigate an "in-flight thrust-control system" developed by Rohr Aircraft. Basically, the system is designed to reverse and modulate engine thrust in flight, thus giving the pilot flying an aircraft equipped with an IFTC system an advantage in combat, tactical maneuvers, and flight operations.

But the "first flight" of the Tiger on February 9—it came after three years of dead storage—by Chief Test Pilot Chuck Sewell was only to give the F-11 a chance to try out its new lease on life. And according to Sewell, there's plenty of life in the old bird yet.

The IFTC system, one of the first experimental prototype efforts utilizing Grumman's advanced flight test technological base at Calverton, has a way to go before it can be fully tested. Next on the agenda for the Tiger: installation of the IFTC system and initial ground tests at Rohr's facility in California. After that, further flight tests at Calverton will insure design integrity and provide performance and operational in-flight data.

Eventually, the Tiger will go to the Naval Air Test Center at Patuxent River, Md., for further flight evaluations of the IFTC system and its application to advanced tactical aircraft.

Right now, the Tiger is drawing a lot of attention at Calverton. It's the mid-50s . . . and you are there.

Pike and Vietnam air ace give Tomcat rave reviews

The nation's first Vietnam ace and a former Marine fighter pilot, now a member of the House of Representatives, came, separately, to the same conclusion about the Tomcat: it's the best air superiority fighter they've seen.

Lt. Randall (Randy) Cunningham compared the F-14 with the F-4, which he flew in Vietnam, and concluded that "The F-14 is just what the Fleet needs to maintain air superiority. . . . " And Rep. Otis Pike of Long Island said that the Tomcat "outflew (the F-4) in every way."

After his ride in the back seat of a Tomcat flown by Chief Test Pilot Chuck Sewell, Rep. Pike said he was "more than ever" committed to the aircraft. He went on to say that "Grumman has built an obviously very solid, honest, smooth machine.

"We flew against the F-4 in tighter turns and quicker rolls. The F-14 can clearly turn inside the F-4, can clearly run away from the F-4, can clearly outclimb the F-4, and makes split S maneuvers far superior to the F-4."

'Just incredible'

Rep. Pike also remarked that the takeoff—going almost straight up after using but half of the runway—"was just incredible."

Lt. Cunningham also referred to that capability, a "rate of climb that far surpasses the F-4J and any other F-4 or any MiG, including the MiG-21 and MiG-23 Foxbat" in an article in the Armed Forces Journal. And he followed that up with the comment that "The energy rate of the F-14 is positively awesome throughout the high-speed climb, and in turns, as well as on a runout, where the thrust response is much better than the F-4."

A little later in the story, written by F. Michael O'Brien, Lt. Cunningham is quoted as saying that the combination of high speed and maneuverability of the Tomcat, "The F-4 cannot touch the F-14 in that category—nor can any other fighter."

Impressive performance

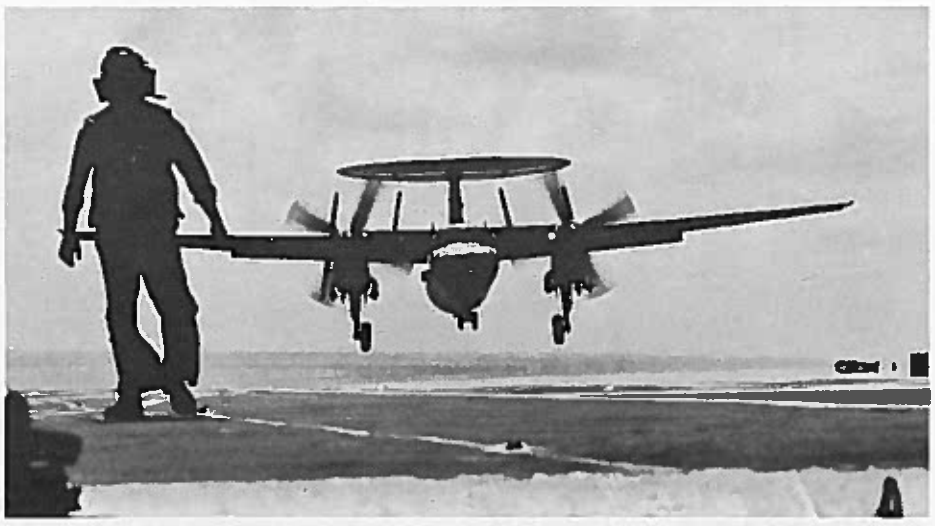
The catalog of F-14 superiority grows larger as Lt. Cunningham spells out performance points:

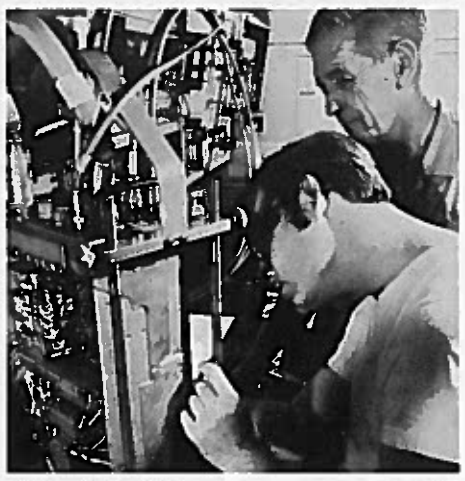
- "The F-14 can turn inside the MiG-21, the MiG-23 or the F-4 at any combat altitude."
- "Then, too, there is the Phoenix missile which gives an F-14 a much more deadly long-range punch than the F-4J and, coupled with the AWG-9 radar, provides a FAD (Fleet Air Defense) capability that allows the F-14 to deal effectively with anti-ship cruise missiles, such as the Styx. Just one F-14 can fire missiles at six targets on different courses."
- "One of the crucial things in a dogfight is visibility, and the F-14 has 360 degree visibility for the crew—the lack of which is a serious handicap in the F-4."
- "Combat radius of action is so important, with the F-14 having twice the search time of the F-4 and the FAD mission—with twice the payload."

Summed up, Lt. Cunningham says that other planes may be cheaper but the need is a "plane that will give you the first place finish. The F-14 is that fighter."

EA-6A

Marine pilot Maj. Fred Ogline and ECMO Capt. Len Ingram were honored at Cubi Point in the Philippines recently. Field Service rep Jerry Comstock presented the two Marines with plaques for logging more than 1,000 hours in the Grumman EA-6A.





'The Field Service rep is Grumman to the customer . . .'

There are no simple, straightforward words that portray the diverse jobs that people in Field Service have to perform. The job is as large as the problems encountered—and then some.

"Have bag, will travel" is certainly part of the overall scope; but merely moving about, say from Guam to the Philippines to Greece, is but a fraction of the responsibility. There is the "ambassadorial" side of the job, for instance: as Nick Scobbo, who heads up Field Service, likes to point out, "The Field Service rep is Grumman to the customer." So, the impression that the rep makes, how he goes about doing his job, how expertly he performs it, says quite a bit about how good the Company is—at least in the eyes of the one who counts most, the customer.

"That means a lot of things," says Scobbo. "He or she has to be technically qualified to do the job, often on his own, without the aid of another Grummanite, because he may be all alone. He also has to relate well with all sorts of people . . . admirals, technicians, pilots, B/Ns, and so on. He has to be able to say 'I don't know' when he can't answer a question, because once he goes to the b. s. he's had it. And when he can't answer a question, he has to dig out the answer as fast as the need demands, and from whatever source; and that includes calling us here at Bethpage.

"One of the most important things is that he's objective, that he has integrity," Scobbo continues. "He has to believe in the Company, too, and I mean truly believe in it. He has to have other qualities as well. Many of them."

If all of this seems rough in terms of qualifications and standards, it is. And it has to be. One indication of how stiff it is can be seen in the ratio between applicants and acceptances: about 800 applications came in during 1972 and 80 were accepted, "and 59 people are now in training," Scobbo says.

That figure does not reflect need, though, according to Scobbo. As of now, there are some 50 home-based (Bethpage) personnel and 220 in the field . . . not enough to cover the responsibilities, as Scobbo sees it.

In other words, job openings exist, now.

For someone with a yen to see the world—and with more than a willingness to work, sometimes under conditions less than ideal—and a determination to do a job excellently, because that's the only way you can live with it, a Field Service job can be very appealing. When you add to that the probability of both excitement and an inner satisfaction with a task well done, the pulling power of being a rep is considerable.

One of the values is "living with the product," wherever it may be. That way the whole view becomes apparent. Put another way, the rep isn't looking solely at a specialized area or feature in the design or manufacture of an aircraft on its way to deployment. Now his thoughts expand to other things, such as maintainability, comfort, in-flight performance reports from the customer, etc. (On the other hand, as aircraft have become increasingly complex, there is a burgeoning requirement in Field Service for specialists in all subsystems, such as power plant, electrical, radar, computers, inertial navigation systems, and hydraulic systems. That calls for a team of people to keep an aircraft "healthy" and on line.)

Close quarters

And while a rep is living with the product, he's also "living" with the customer—and quite closely if he's on an aircraft carrier. After all, as Rep Leo Schwarz points out, "Where are you going to go?" The factor of proximity is a distinct plus. Tom Giannetti, who has been on a number of carrier tours, observes that "when you're aboard a carrier with a squadron, you and the Navy crew know those aircraft and their histories. They get to know you, too, and to lean on your expertise, and especially so when problems crop up. Here the communications are as firm as they can be, and the assessments of the aircraft are detailed."

Those assessments, whether good or bad, help not only the customer but the rep and Grumman as well. For there is a constant, regular feedback: the rep writes weekly reports to Scobbo (and to program and management people as nec-

Always busy. **Wherever the need is—that's where Grumman Field Service will be, for their charter is to service Company products, often 10 or 12 or more hours a day seven days a week. For the customer, Field Service is Grumman. (Photos by Bruce Montgomery)**

essary). It's a running log of what's happening — occasionally, what's not happening — on any program the rep is responsible for.

The reports flow in from all points:

Walt Schnaderbeck at the Naval Air Station, Cubi Point, Philippines: "A C-2A back in action after the blades of a taxiing SH-3 helicopter damaged it as the C-2A sat with wings folded. . . . "

Vince Romeo at Hawaii: "There's been a suggestion that it might be wise to push modular housing in the Pacific Basin area, where our non-aerospace product line can be exploited. Countries we may consider at this time are . . . Australia, American Samoa, Micronesia, Guam, Philippines, Indonesia, Malaysia, Singapore, Thailand . . . "

Herb Wendell at "the rose garden" in Thailand: Lodging is "a field tent, a folding cot, a mosquito net, and a small wooden foot locker. Bathing facilities consist of a spray of cold water available twice daily for one hour in the morning and for two hours in the evening. Two hot meals are available from a field kitchen daily. . . . " A bit later in the report, he remarks that at the site, "you're ankle deep in mud or dry and dusty. Laundry facilities are of do-it-yourself nature, when water for washing is available, which is seldom." To cap it all, "Heat during the daylight hours makes it impossible to sleep. . . . "

Philippine assignment

Doug Barker at Cubi Point: "Tom Garrity spent approximately two weeks aboard the America and Saratoga giving formal training and on-the-job training on the (E-2B) computer detector. . . . " Walt Schnaderbeck reports "the heaviest rains ever recorded in the Philippines" and goes on to say that "During the month of July Cubi Point had over 75 inches of rain." A few miles away, between Cubi and Manila, "total rainfall exceeds 185 inches," which resulted in "severe flooding and the complete isolation of our base. . . . "

Mario Boltri of the Mediterranean team: "Operation for (the aircraft carrier) FDR has not changed since their Mediterranean tour in 1971. Generally once aircraft go up to the flight deck . . . they will seldom come below decks unless high priority is placed on a particular aircraft. Tankers and A-6Cs are doing well."

Nick DeJesu in Naples: "The Turkish Air Force is in the process of acquiring a quantity of USN surplus S-2E aircraft for their military requirements."

Our man in Saigon

Paul McDermott, who spent a lot of time with the U.S. Army in Saigon and the hinterland, tells (with too much modesty) what a so-called normal day is like:

"The Grumman Field rep normally starts his day with 0630 breakfast with the pilots. The Commanding Officer then holds a daily meeting right in the mess hall. There the rep sits in on mission problems encountered the previous evening (including) aircraft performance and techniques, safety and emergency procedures, and blackboard sessions.

"From there a visit is made to the maintenance hangar and the flight line to see what problems have come up during the night. The rep is constantly looking to spot failure trends or potential trouble areas before they affect aircraft availability. His ability to get immediate response from Grumman is of invaluable assistance. . . . "

McDermott continues:

"Although there is only one Grumman rep for the complete aircraft (in this case, a Mohawk), the Army Electronics Command has 12 reps to cover avionics and sensors. Interface is made with those reps to mutually solve all problems on a daily basis."

And McDermott goes on to say, "The maintenance officer and the Grumman rep normally return to the flight line to monitor the night launch operations —and there is no such thing as 'set working hours'." A rep is on call to assist 24 hours a day, and his satisfaction is seeing a mission completed successfully.

"Periodic visits are made through the Army chain of command to ensure they are aware of our presence and to provide information."

Another point should be emphasized: aboard a carrier, at sea, every rep has a seven-day week and a full day. For the most part, that's also true of the land-based reps . . . but they sometimes get to go on "excursions" of sorts. So there is a difference.

Of course, if you're on a carrier you miss some of the amenities of home life. If you're a bachelor, no problem at all—in fact, even if you're married, and if your wife fully understands your dedication to your job, no problem either. And the proof of it is that the majority of Field Service men are married and have homes in the area where they're assigned. (Something new has been added, too: for the first time, a woman is in training now for a Field Service post.)

Rep 'on his own'

"One of the real benefits of a Field Service job," says Scobbo, "is that the rep is on his own, in a sense: he has the smarts to do the job and needs a minimum of outside help. He's self-reliant, tackling the job by himself, or as part of a small crew. There's an air of freedom about it —though he's aware, of course, of customer-Company relationships that are complex, urgent, and immediate.

"And he knows, too, that he has a kind of in-house diplomatic immunity, that he can—**he must**—call 'em as he sees 'em. Anything less than complete truth about our product and services hurts him and the Company. So he's free to criticize, just as he's free to innovate and advance suggestions. In fact, that's a necessary part of his job. He also knows that he can count on us at home base for all the help he needs."

That home base team is really the solid point of reference, the hub of the Field Service activity. The people there—many of whom have had experience as reps — are positioned at the heart of the program action; and therefore, they're in the know as to current trends and events, especially on matters that go beyond the specific duties of the rep.

They're in the best position to see the overall view, too, and they pass this often critical information on to the reps. The result, then, is what is absolutely required if the customer is to be satisfied: a strong and honest communications loop.

Man for all reasons

So the home base team has to have the same skills and talents as the reps. On top of that, the team has to organize, digest, and transmit information from base sites all over the world; to make personnel, product inventory, and product modification analyses; to develop failure statistics; to help set up annual budgets; to tie in closely with product sources — research, advanced development (as necessary), Engineering, Quality Control, Business Development, etc. It's all this that the rep relies on if he is to function.

A rep, then, must be a self-starter, an expert on his product, a repairman, a reporter, a "diplomat" and "chaplain," a nuts-and-bolts man, a full believer in the Company, a person of integrity, and a **hard worker.**

"The qualifications are high," Scobbo says, "but the rewards in travel, excitement, and doing something worthwhile —call it the feel of accomplishment— are the intangible values of the job. Talk with the reps and you'll see the indefinable satisfaction in their work that I think characterizes them. Despite tough duty, they're a happy, composed group. That's the best advertisement I can think of for Field Service."

service milestones

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Harold A. Arnesen, Assemb. Tool & Handling Equip. (2)
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G. B. Rausch Jr. | G. Eyring | C. W. Hartnack | P. L. Regan

T. W. Markley | R. E. Somers | A. R. Kemp | G. A. Rogers

D. C. Broggini | G. W. Hartman | T. P. Trifaro | W. J. Hauck

Chance meeting of ex-Marines uncovers one's potential assets

Ben Cargile walked into the Grumman Employment Office at Plant 28 three weeks ago and applied for a production job. Dan O'Brien, manager of Employment, saw immediately that Cargile had a strong interest in aeronautics, was a "warm-hearted individual" and certainly looked liked a potential asset to the Company. Cargile and O'Brien are both ex-Marines so their conversation came easy and relaxed. Two other interviewers, one from Administration and another from Engineering, agreed with O'Brien: Cargile looked like a prime candidate for the post of engineering planner in Resource Control, where he would help determine the man-hour needs for the Company, such as deciding how long and how many men are required to complete a specific assignment.

Born in Nashville, Georgia, and raised in Jamaica, New York, Cargile is a graduate of Aviation High School. He has been a mechanic with Pan American Airlines and studied Aerospace Technology at New York Institute of Technology before entering the Marines in 1969. He was chosen for officer's candidate school and commissioned, and now is a first lieutenant in the Marine Corps Reserve. His military career has taken him around the world, including such places as Japan, Okinawa, the Philippines, and Guantanamo Bay, Cuba. Cargile, a physical fitness enthusiast, was active in track and field when in high school in New York City, football in the military, and also studied karate while in the Orient. Cargile comments that he "likes working with people, 'digs' leadership roles, and definitely enjoys being free and 'swingle'!"

With two-and-a-half years left to complete in the engineering program at NYIT, Cargile says: "A good route to success for any young man would be to plan his course of life and try to be as mature an individual as possible in all situations, no matter what the problem may be."

'Must not lessen effort'

Having served with many different types of Americans while in the service, Cargile says, "I feel that America has come a long way but it must not lessen the intense effort to make all of its people truly equal." He adds, "I don't believe in integration of the different ethnic groups because I'm in love with my way of life and society. I do feel, however, that an intense industrial effort must be made by all Americans to reach a homogeneity of class structure."

Welcome aboard. No one was more surprised than Ben Cargile (C) when he applied for a production job at Grumman and was soon hired as engineering planner. Welcoming committee with Cargile is Frank Hackert and Jim Romanski of Resource Control, Plant 1. (Photo by Bob Settles)

CALENDAR of events

Notice of events for period Mar. 9 to Mar. 23 should reach Plane News by Thursday, Mar. 1.

American Society for Metals: Local meet., Wed., March 21, King's Grant, 150 Sunnyside Blvd., Plainview, speak., I. Sterwart, "Court Cases, Metallurgical Failures," open to outsiders, free cocktail hour, 5:30 p.m., dinner, 6:30 p.m., meeting, 8 p.m. Phil Niedringham, LR 5-3076.

Coin Club: Every Wed., 12:05, Plt. 25 vendor conf. rooms, informal lunchtime meet. Ken Hale, Ext. 1936.

Ex-Servicemens Club: Monthly meet., Wed., March 7 at 7:30 p.m., Plt. 28 audit., Vets counselor avail. alt. Thurs., next dates: Feb. 22, March 8, March 22. Al Kordula, Ext. 2814.

Family Campers: Sun., March 4, 5 p.m., Guard Hdqtrs. Bldg., Plt. 18, month. meet., guests welcome. Herman Heinlein, Ext. 9518.

Flying Club: Fri., March 9, 5 p.m., Plant 28, film, "Lockheed L 1910-11," guests welcome. Betty Schledorn, Ext. 7372.

Industrial bowling: Grumman will sponsor and participate in L.I. Industrial Men's Bowling Tournament at Mid Isle Lanes, Peninsula Blvd., Hempstead. Tourney opens Saturday, Mar. 3, at 8 p.m., and continues Mar. 10, 17, and 24. Sperry Jamboree will be held tomorrow, Saturday, Feb. 24, starting at 8 p.m. at Garden City Bowl, Stewart Ave., Garden City.

Old Friends Club: Month. meet., Tues., March 6, 7:00 p.m., Tower Rest., Hicksville. Frank Mistretta, Ext. 2683; Sat., March 24, 9:00 p.m., K of C Hall, Farmingdale, St. Patricks Day Dance. Frank Mistretta, Ext. 2683.

Stamp Club: (Bethpage), First, third Wed. of month, 5:00 p.m., Plt. 30 Cafe., Circuit book sales, swap, auction, discussion, new members & guests welcome. E. Manaker, Ext. 3513.

GAA slates cruise, Hawaiian flights

Ever promised yourself a leisurely cruise in the sun . . . with stopovers at several Caribbean ports . . . an interesting itinerary . . . delicious meals . . . and top onboard entertainment. Who hasn't? And perhaps the cruise scheduled for June 9-16 by the Grumman Athletic Association may just fill the bill for you.

Here's the way the trip shapes up: depart Kennedy International for Miami on June 9, board and sail on the SS Mardi Gras that evening. Stopovers are scheduled for San Juan, St. Maarten, St. Thomas, and Nassau before returning to Miami on June 16 for the return flight to JFK. And while your onboard, you can enjoy the ship's lounges, cocktail and dining areas, movie theater, beauty salon, health club, swimming pool, grand ballroom, and duty-free shops.

For this June cruise, the only one scheduled for 1973 says Bob Benn, GAA director, the accommodations (double occupancy) are: three categories of cabins at $406, $450, and $494. All staterooms have private facilities, most are outside cabins, some in the $406 range, however, will be inside.

Sign-up March 7

Included in the package are round-trip flight on Northwest Airlines, transfers between airport and ship at Miami, full American breakfast, lunch, and full-course dinner, snacks and midnight buffet each day, and entertainment in the Mardi Gras night club.

Eligibility for the cruise is limited to Grumman employees and their immediate family.

If you're interested, the sign-up date is March 7, starting at 5:30 p.m. in the Plant 28 waiting room. Oh yes, payment for the cruise in full is required at time of sign up.

Next September, the Grumman Athletic Association will have two flights to Hawaii on American Airlines. One of the groups will stay at the Hawaiian Regent Hotel at Honolulu, the other will tour the islands with stopovers at four famous resort hotels.

Here's the way the two trips stack up:

All Waikiki Beach: Those who sign up for this flight will be gone eight days and seven nights, departing from Kennedy International on Saturday, September 15, and returning Saturday, September 22. Eligibility is restricted to Grumman employees and retired personnel, their families (parent, child, or spouse), and relatives who live in the same household.

Accommodations (double-occupancy in twin-bed rooms) at the Hawaiian Regent Hotel will include two meals per day—full American breakfast with champagne, table d'hote dinner—transfers between airport and hotel, gratuities, and departure taxes.

The cost: $439 per person.

All Hawaii Tour: Flight members in this tour group will depart Kennedy International the morning of Sunday, September 16, on American Airlines with stopovers at Honolulu (Hawaiian Regent Hotel), Kauai (Kauai Beachboy or Kauai Surf), Maui (Maui Surf or Maui Hilton), and Hawaii (Kona Surf or Kona Hilton), for a total of 13 nights in the islands. Return is scheduled for Sunday, September 30.

Included in the tour package are twin-bedrooms (double occupancy), two meals per day—full American breakfast with champagne and table d'hote dinner—transfers between airport and hotel, gratuities, and departure taxes.

$824 per person

The cost: $824 per person, double-occupancy and modified American plan meals throughout; or, $724 per person, double-occupancy and MAP meals on outer islands only.

Eligibility for this tour is restricted to Grumman employees and retired personnel, and their families (parents, child, spouse, brother, sister). Depending on space available, guests can also be listed.

Although the trips are not scheduled until September 1973, the Grumman Athletic Association is signing up for the trips on Wednesday, February 28, starting at 5:30 p.m. in the Plant 28 waiting room. Personnel must be present for the drawing to determine order of sign-up, says Bob Benn, director of GAA, and a down payment of $300 each (checks made out to Bethpage Aircraft Tour Club) must be made at time of sign-up.

If you have any questions, call Bob Benn, or Marita Looney, on Ext. 2133 or 2269. They'll be glad to help you.

Coming up . . .

Benn also reminded Grummanites that there will be flights to Barbados (Miramar Beach) and Martinique (Club Mediterannee) in November.

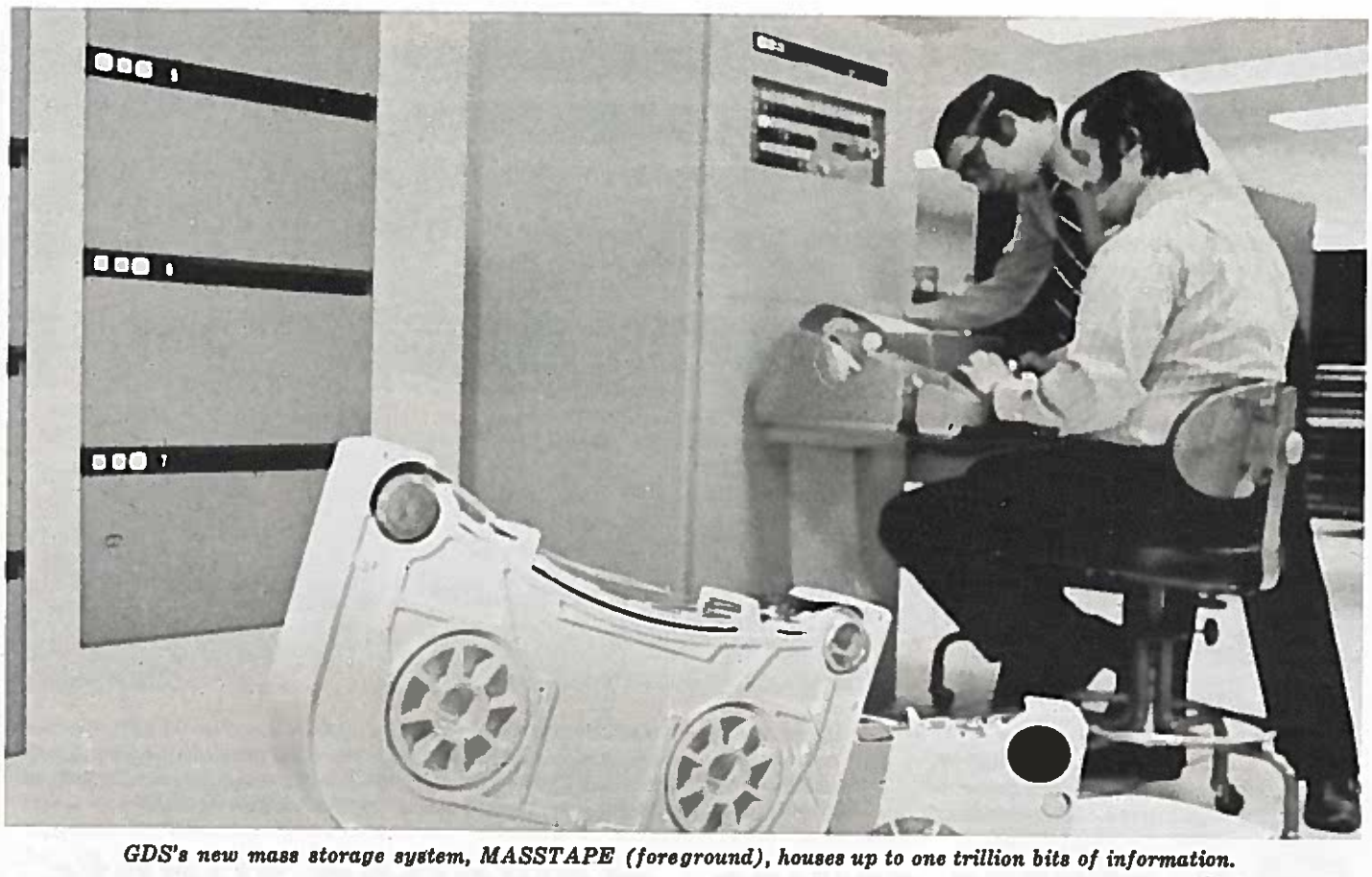
Discount tix

Special discount tickets are available at Grumman Employee Service Offices for the Shipstads and Johnson Ice Follies which will be playing at the Nassau Coliseum from April 19 to April 29. Special attraction in the Ice Follies this year will be Trixi Schuba, 1972 gold medalist and world figure-skating champion.

Discount tickets offer $1 deduction on $8 and $7 seats, and 50 cents on $4 seats for juniors (16 years and under).

Shows on April 19, 24, 25, 26 start at 8 p.m., and those on April 22 and 29 begin at 6 p.m.

Tickets are available at all ESO offices. Checks or money orders should be made out to "cash" or Employee Service Office.



GDS's new mass storage system, MASSTAPE (foreground), houses up to one trillion bits of information.

GDS . .

When Pete Viemeister talks about Grumman Data Systems, the 44-year-old president of Grumman's broad-based computer services subsidiary usually eases into a discussion about the people in the organization. Sales growth, he says, is directly related to the effectiveness and accomplishments of the people. And since GDS is chalking up sales increases almost every month and doubling its annual commercial sales each year, it is understandable when Viemeister says, "There are so many good people here doing a lot of good things."

As a spinoff of Grumman Aerospace, GDS was formed three years ago to utilize the Company's extensive computer facilities in the commercial marketplace. Today, GDS has one of the largest and most modern computing facilities in the Northeastern U.S. Its more than 1,100 employees offer computer services and systems to business, science, institutions and government.

While Grumman Aerospace remains GDS's largest single customer for which the new firm continues to provide computer services, GDS is also seeking new "commercial" or non-Grumman business. It is toward both Aerospace and commercial business that GDS's four primary objectives are directed:

To bring new revenue into the Grumman family of corporations.

To improve the quality of GDS's computer services.

To improve the value of its services.

To develop the ability and potential for future growth.

How the people at GDS are meeting their objectives, among other things, was discussed recently during an informal interview between Plane News and Viemeister.

To what extent has GDS been able to penetrate the commercial computer services marketplace?

Our first year was a modest one because we were learning about the commercial world. We had to see what people were buying and how their needs matched what we had to sell. Then, in 1971, we actually doubled the non-Grumman business we did in 1970, and in 1972, we more than doubled our sales of the previous year. In addition, with only one or two exceptions, our non-Grumman revenues every quarter have exceeded those of every previous quarter since the origin of GDS.

How has GDS been able to mature so rapidly in the commercial marketing arena?

Three years ago when GDS opened for business, all of our employees had been transferred from Grumman Aerospace. At the time, only three percent of our people were working on commercial business; now 20 percent are getting commercial experience. They have not only had to think about costs, they have also had to concern themselves with such things as price, profits, and competition. Now we have sales people who know their way around, we have standard price lists for the very competitive services we offer, we have a base of customers who have done business with us, and we have some unique services and products in development that may become future business for us.

Is GDS developing hardware products as well as services?

Yes. One is MASSTAPE, a new on-line modular mass storage system that is a spinoff of techniques developed for the Apollo program. It stores as many as one trillion bits of information then issues the data as needed at rates up to one million bits a second. One MASSTAPE unit occupies only one-tenth the space needed for an equivalent number of tape reels.

Another new GDS product is the Automatic Digital Pipette, an electronic device for dispensing liquids and semi-liquids into bottles, vials, cans and ampules within 0.5 percent accuracy.

What is timesharing?

It's a service that allows a customer to talk interactively from a remote terminal to a computer. Although many customers may be doing this simultaneously, the timesharing system essentially allows each one to work as if he were alone on the computer. We sell timesharing services at standard prices of $7.50 per hour connected and 35 cents per second for calculating time. Anyone with a computer terminal can get an identification number and use our service. If a customer doesn't have a terminal, he can come into any of our business offices and use our terminals.

What is remote batch computing?

When a customer has his own computer printing equipment, he can put his "batch" of cards in his terminal and transmit the data via telephone to the GDS computer. The computer does the calculating and sends the information back over the phone lines for printing on the customer's equipment. In other words, the customer does not have to carry his input to the computer center to get his work done.

With so many different types of services, what do you do to improve the quality of GDS's services?

Timeliness is one example. We measure the difference between the time we schedule a job to be done and the time it is actually completed. If we're within one hour of the scheduled time, we say the job was completed on time. During GDS's first year, about 70 percent of our jobs were in the on-time category; now, 90 percent or better are on time.

What is the volume of work done by GDS?

About 20,000 individual jobs a month, our most complex assignments is the Grumman payroll, which we run every each of which is a custom job. One of week. We classify it as only one job.

Do things ever go wrong?

You might say we're like an airline in regard to errors. We get almost all of our passengers where they're supposed to go when they're supposed to get there. Occasionally, though, we lose a suitcase which may cause the customer to get angry and vocal.

'. . . in 1971, we actually doubled the non-Grumman business we did in 1970, and in 1972, we more than doubled our sales of the previous year.'

Pete Viemeister, President
Grumman Data Systems

Past, Present and Future

How do you improve the value of your services?

Value is directly related to equipment. Newer computers tend to be more cost-effective than older ones so we improve our efficiency by periodically changing our equipment. Instead of renting all the machines from a manufacturer like many of our competitors do, we reduce our costs by buying some of our computers.

What types of equipment does GDS have?

In our main building in Bethpage we have several models in the IBM 360 and 370 series. One of these is the 360/67, a large timesharing computer, which does timesharing during the day and batch work at night. We also have a number of other computers. One is used solely for batch and scientific work for Grumman Aerospace while another is used for a tracking system and material master file. The largest and fastest machine we have is a 370/165. All told, we are equipped to handle just about any job that comes our way.

What is ATS?

It is the Automated Telemetry Station located at Calverton. It is both a capability and a facility that was developed to work hand-in-hand with Aerospace for flight testing of the F-14. ATS supports test flights by analyzing data while flights are in progress. Its computer is used for other calculations — such as detailed analysis of recorded data — when flights are not in progress.

Is ATS only for Grumman Aerospace's use?

No. One of our outside contracts is with Boeing Computing which plans to use our ATS for support flight testing a new helicopter. We have also proposed to develop a similar system for a government agency.

How large is GDS in relation to other Long Island companies?

If you consider GDS as being completely separate from the rest of Grumman, then GDS, like Grumman Aerospace, is one of the 10 largest companies on Long Island.

Does GDS try to put limits on the radius of its marketing area or is the distance between the customer and the computer unimportant?

You can send a lot of data over the telephone wires today so distance in this respect isn't too important. But data is like any other product; it costs money to ship. If we go too far out of our marketing range, the higher communication costs could put us at a disadvantage with our competitors. Therefore, we concentrate our sales efforts in the eastern U.S., primarily in metropolitan New York, Boston, and Washington, D. C.

GDS's Automatic Digital Pipette (shown here and on cover) electronically dispenses liquids within 0.5 percent accuracy. (Photos by Bob Settles)

What do you consider to be GDS's overriding management philosophy?

We are trying to recapture the benefits of smallness. So many things in industry and society have become large and impersonal. Therefore, we are building up "mini-businesses" or profit centers at GDS so that each individual can see the effects of his efforts. For example, when GDS first began, Bob Nafis, who is now our vice president in charge of products, was responsible for starting up new businesses and for getting us into new fields. Once he had a business started, someone else took over to shape it into an ongoing business. When it got substantial enough, we appointed a manager and had a mini-business within GDS. Everything is visible this way and we can see what's going on all over the company.

Who are your key people?

When you look at our organization chart, it tells you that Walter Wood handles software and computing services, including the Grumman account, commercial computing services such as timesharing, and acts as head of the software services area. Bob Nafis is responsible for the development of products and Jim Conners oversees the Data Systems Institute and COMversion. He is also president of Computility. Burt Stern and Jim Pettit oversee our financial affairs.

But you can't just list the officers and say they are your "key" people. There are so many good people here doing a lot of good things. Sure, our vice presidents are quite able, but we also have many other key people here. Every person at GDS is here because he or she is needed. Everyone is "key".

In 1971, you acquired Computility. Do you plan to make more acquisitions of small computer service firms to insure future growth for GDS?

Our goals are not dependent on acquisitions. If we find an acquisition that makes good sense and one that is of good value — like our previous acquisitions have been — then we will consider it. At the same time, we think GDS can grow independently of acquisitions.

Has Computility proved to be a profitable acquisition?

Yes. When the Boston firm first came to our attention, it was in bankruptcy proceeding, it had lost a lot of money and it was still losing. We acquired the company in February, 1971, and Jim Conners took over as president. Vice president John McGonagle helped in selling and some of the people already there, like Ron Misasi and Rich Stevens, have turned it into a moneymaker. They cut costs and increased sales. Before the second year was over, they were turning in monthly profits. The Company recently moved to larger quarters with improved equipment and it's getting stronger all the time.

What is Aero Data?

A new GDS subsidiary located in Syosset, N. Y. It is composed of some very talented people who provide consulting and analytic service to such customers as airlines.

What is COMversion?

COM stands for Computer Output to Microfilm and COMversion is a relatively new GDS activity. It specializes in taking data directly from magnetic tape — a reel with magnetic signatures — and putting it in the form of words on film. The advantage is that one small reel of film can now hold the same amount of data as, say, 25 pounds of paper.

In addition to providing computer services, GDS has been in the educational field with Data Systems Institute. How well has this facility been accepted by other educational institutions?

DSI has developed the reputation for being a high quality place to learn to be a computer programmer. It has been recognized for college credit by the New York Institute of Technology and we're on the brink of being accredited by three other colleges. Because a school has to have graduates in the field for two years before it can get Veterans Administration approval, we weren't able to obtain VA approval for our courses until last month. We have also introduced a key punch course which has been popular, and we are now having afternoon seminars for busy people in data processing who want quick courses on specialized computer-related topics.

What do you foresee GDS's role to be in the future?

Our primary goal is to increase our commercial business to the point where it exceeds the work we do for Grumman Aerospace. In five years, we expect our commercial sales to be about 50 percent of GDS's total; in 10 years, the percentage should be even greater. The work we do for Aerospace is very important and we are dedicated to continuing to do a good job in that capacity. At the same time, we are aggressively seeking new business elsewhere.

PETE VIEMEISTER

For a man of 44, Pete Viemeister already has 27 years of association with Grumman.

"I started when I was 17," says the Grumman Data Systems President. "I had won a Grumman scholarship in 1946. It was just after the World War II and those of us in the program felt lucky to get a summer job of any kind. I drilled 142,000 holes with a hand drill motor the first year. I asked the personnel director the next summer if I might do something more challenging so he gave me the job of assembling tail wheels."

Viemeister worked for Grumman each summer during the years he attended engineering school at Rensselaer Polytechnic Institute, Troy, N. Y. After graduation, he became a full time employee, first in engineering, then in business development. He moved into corporate planning from which he later became secretary to the executive committee and assistant to the Board Chairman and President of Grumman. In 1968, he attended graduate school at Massachusetts Institute of Technology as a Sloan Fellow. He says it was one of the "greatest opportunities of my life."

Upon returning to Bethpage, Viemeister helped Grumman plan to separate its computer facilities from Aerospace and form a new company. Not long after that, Viemeister was named President of GDS.

Get yourself into the big picture — support GAA

If you've ever had a hankering to see the world, GAA can arrange it. And if your interests are more mundane—say ping pong, basketball, softball, bowling, or such — GAA can arrange that, too. Too athletic, you say? How about coin or stamp collecting, duplicate bridge, or any of a number of other interesting if less physical past times. GAA can make the connection for you there also. Interested in family camping, amateur radio, model-plane making? . . . That's right, now you're getting the picture. The recreation association is the place to get started there, too.

If you want to keep yourself in the big recreation picture at Grumman, you can help yourself and others, too, by lending your support during the upcoming GAA membership drive. It starts next Thursday, March 1, and concludes on March 31. And what's the tab? A buck. Unbelievable? Probably, especially in these days of inflated prices, but the membership for GAA is only $1. It has been that way for a long, long time, and it's amazing how Bob Benn and his GAA crew members—Mike Cherry, Marita Looney, Herb Mahoney, and Chet Baumgartner — have learned to stretch those dollars.

Of course, they get help. Although the GAA provides moral and some financial support to most of the clubs at Grumman, and supplies equipment for all the inter-mural leagues at Grumman, it doesn't all get done on your dollar—not even on the thousands of dollars collected every year. The Company digs into its own coffers to help supplement many of these activities, and also pays all of the expenses incurred by the Grumman varsity teams. That bears repeating. Grumman pays all of the expenses incurred by the Grumman varsity teams. GAA dollars collected are spent only on club or inter-mural activities—so you might say, your buck helps in any number of ways to keep things moving on the recreational scene here.

And if you think you don't get your money's worth out of your GAA dollar, consider this: you may not participate in or take advantage of any of the numerous clubs or services affiliated with GAA, but have you never stopped by to view a hobby show, or an art and photography exhibit, or flower show? Your membership dues helps to buy awards for those shows.

To top it all, 15 Kodak pocket Instamatic cameras and 50 sets of Grumman glasses will be up for grabs at a drawing April 6 to mark the conclusion of the drive. Mike Cherry, who's directing the GAA membership drive, says that tickets will be available starting March 1. See your supervisor or department administrator.

C'mon, get in the big recreation picture. Give a buck. Be a hero.

Kick it . . . now!

You're a smoker, you'd like to kick the habit, but you can't quite do it on your own? Well, listen to this message.

Go to a free lecture on the subject "How to stop smoking easily and permanently, without drugs, without weight gain, without any nervousness." Sound hard to believe? Probably so if you've been on the weed for a long, long time.

The "stop smoking" talk will be given Wednesday, February 28, at 5 p.m. at the Personnel Building, Plant 28, by Carol Fox of Smoke Watchers, Inc. The course runs about 14 weeks and is sanctioned by GAA.

Why not give it a try? The only thing you have to lose is your habit.

If you're a joiner, there a number of clubs sanctioned by the Grumman Athletic Association that may interest you. Numismatists, philatelists, campers, skiers, model plane makers—you name it, in fact—are all welcome to join the clubs of their interest. And if your specialty isn't on the GAA list, why not call them and ask about establishing such a group. By the way, these clubs, their contacts, and the extensions, were provided by the GAA.

Club	Contact	Ext.
Campers	Bill Lord	2914
Chess	Alex Ikonnikow	7592
Coin	Sam Koeppel (Bethpage)	2377
	Dick Rafe (Calverton)	287
GAC Divers	Ken Hale	9387
Bridge	Sid Stone	3652
Engg. Model Society	Harvey Knopf	7944
Ex-Service Men's	Al Kordula	87259
Fencing	Art Chomas	1926
Flying	John Brook	2221
Garden Forum	Kay Zuk	3391
Old Friends	Frank Mistretta	2683
Amateur Radio	Emmett Goodman	87125
Rod & Gun	Vincent Garzia	1641
Gophers Rifle	Hank Womble	3938
Ski	Bill Flynn	1823
Stamp	Sam Campbell (Bethpage)	7982
	Bill Mashman (Calverton)	572
Toastmasters	Tom Campbell	3157
Retiree	Marita Looney (GAA)	2133

Becker, Barton hit 684, 665 for new pin records

Although it took them awhile to get untracked, the Captain and His Crew are now starting to run away from the rest of the league in Patchogue Mixed action. And Ken Becker didn't offer much hope to the rest of the loop that things were going to change any—at least not in the immediate future. Ken's 226, 204, and 254 in recent play added up to a record-breaking 684 (he missed out on a game mark by three sticks) and that boomer got the Crew winging toward team game and series records of 764 and 2,086. Not bad for a night's work.

Dick Lindstrom collected 211-594 in that round, and earlier showed successive rounds of 213-584 and 242-594. Joan Burgess (another Crew member) rolled 526 in her team's record breakers, while she too stood out earlier with 548 and 550. Other highlights included Anita Becker's 479 and Ken Becker's 213-577, and Howard Van Schaick's 547. . . . Wes Johnson's 646, coming on games of 210, 215, and 221, propelled the Lucky Strikes closer to the Red circuit lead. Other highs: Ben Monte's 231-200-609 and Joe Glasser's 205-208-599.

The Spoilers may not ge going anywhere in the Hawkeye Mixed loop—they stand 12th in the 14-team league—but one team member, Phil Barton, boosted his chances of copping a prize at season's end. Barton hit games of 200, 211, and 254 to end the evening with 665. That total wiped out Vince Crevoiserat's former record of 637, and Barton's high game nearly erased Vince's 257 mark, too. Arlene Schwemmer shot 209-531 and Ann Wuestmann fired 515, while earlier, Crevoiserat signed in with 235-607; Nick Bilogan, 210-212-579; Tom Murtha, 217-590; George Moritz, 222-580; Fran Zuk, 490; Lee Newcombe, 497; Maude Schulz, 517; and Eleanor White, 518.

Aquilino fires 630

With a team name like the 4 Guys—wasn't that a singing group in the early 40s?—is it any wonder that Joe Solomon, Bill Fey, and Dan and Poe Aquilino are making wonderful music together while leading the chase in the Aerospace league. And just to make sure there were no clinkers in the latest songfest, Dan Aquilino took over the lead, throwing a 235-214-630 to lead the 4 Guys to a 25-2 near-sweep over the Foul Four. Although it fell short of individual records, the effort helped increase the team's lead over the second-place Jesters to 39 points. Solomon aided in that win with a 521, but runner-up honors for pinspilling went to Buddy Groeber, who had 223-558, and Ted Dija, who threw 550.

In the Masters loop, Ray Zeller put together hefty 222, 226, 222 games for an 872 total in the four-game set. The Demons took the league lead from the Webs as Phil Piacentini sparked the surge with 775. Earlier, Dick Spalding's 232-817 and Vin Crevoiserat's 282-815 stood out in the individual efforts, followed by Ray Sutton's 225-800. Jack Nielsen's 222-787, Ed Gabriel's 224-776, and Paul Waisanen's 245-776.

It didn't help the Unknowns very much—they're still ninth in the 16-team field—but Norm McDowell boosted his own ego a bit in a recent Classified session with 248-620, high for the round in both departments. Norm holds the league-high game record of 276. In later action, Jack Otto hit 243-201-614, Mike Mustapick shot 253-605, Mort Husted, 206-210-601; Bob Hoehn, 224-603; Jerry Rainford, 234-600; and Joe Whelan, 203-213-593. Earlier, Don Combes fired 213-213-584 and John Herman shot 580 with help from a 222.

Ed Schlott tried to get the Choppers moving with 234-232-647 and Joe Glasser fired 224-605. Earlier, Walt Stehlin flipped a 246-617 to pace Black pin scoring in a session featured also by Frank Apa's 234-606, Bob Klussman's 226-578, Jim Herzberg's 222-576, and Sid Weib's 202-575. . . . Monica Wojtyniak keeps bombing those sticks in the Syosset Mixed loop. Monica, who held the women's string record of 568, hit 574 with a 211 a couple of weeks ago, while John Betterino put

(Continued on page 13)

Ken Becker

Phil Barton

Pin tourney

John Alston will lead the Grumman varsity bowling five into the L.I. Industrial Men's Tournament at Mid Isle Lanes, Hempstead, starting Saturday, March 3. Alston earned that hour by finishing with 216-534 in the final round of the trials, while Ed Hilbert made a strong comeback on 210-223-627 for second place. Rounding out the first five are Jack Nielsen, George Ulrich, and Buzz Goodman.

'Cats have their ups and downs

The Nassau County Police Department is making it difficult for the Grumman varsity basketball team to recapture the Industrial League championship. They edged the Hellcats, 101 to 95, the first loss in league play for the Grumman cagers.

Earlier in the season, the Grummnites had trounced the Police 96-84. Both squads now share top honors in the league with records of 5-1.

Bill Diercks did fine rebounding work for the Hellcats as Frank Quarto, Eddie Krol, Ron Bartlett, and Jim Cruthers scored 20, 20, 15, and 14 points, respectively, but to no avail. The Nassau Police were victors at the final buzzer.

In Thursday night basketball league play, the Newcomers continued to reign as they racked up three more victories to make their league record 8-0. They demolished the Digits, 104-67, with Ed Krol leading the way with 26 points. The Tom Cats were their next victims, being assaulted 76-63. Vince Clerico led the winners with 25 points as Billy Foote, and Don Martinolich, and Tom Cobey controlled the backboards. Tom Schifini scored 20 points for the losers.

Vince Clerico led the Newcomers again, this time with 21 points, as they rolled over the Druids, 103-75. The closest the losers got to last year's champs was at halftime, 46-40. The hustling offense of the winners was too much for the Druids as the Newcomers poured it on, scoring 57 points in the second half. The defending champs had five other men in the double figures: Krol, 18; Lee Gendron, 16; Al Bauer, 14; Bille Foote, 14; and Doug Kueling, 10. The losers were led by Al Prime with 26 points.

Ds do it—finally—with pistol win

All things come to those who wait . . . and since the Grumman D team has waited — and suffered — through seven consecutive defeats, it was only fair that somewhere along the line they would be rewarded for their patience. And it finally happened. The Ds scored their first victory of the season in the expert division of the L.I. Industrial league by outfiring Brooklyn Lab, 1,056-1,054.

It wasn't quite that easy. Winning their first play by only two points was exciting enough, but when Brookhaven protested the match to league officials, the Ds had to wait out that decision—which turned out to be favorable to them—before they could even think of hoisting one to their very first win this season. Now they hope they're on another sort of streak. Dave Rice, 277, Art McKee, 266, Jerry Minerva, 259, and Roger Seybel, 257, led the D team.

The Grumman Golds were on target again—that makes seven wins and one loss — as they dropped Kollsman Instrument, 1,082-1,045. Hank Chau's 279 paced the win. Contributing to the victory were Ron Trenkner, 273, Bob Bergeman, 266, and Phil Boehm, 264.

But in their next match, the Golds, too, came a cropper once again as they stumblued over Pan Am B, top team in the league, to lose, 1,077-1,105. Trenkner's 274, Bergeman's 271, Chau's 267, and Boehm's 265 were high.

In the sharpshooter division of .22 caliber pistol competition, both the B and C teams lost. Howard Saltzman's 256 and Bill Boyce's 254 were high for the Bs in a 1,006-1,018 loss to IBM, and Charlie Boppe's 250 was the top mark for the Cs in their loss to IBM, 986-1,014.

The Bs took it on the chin again, this time from the Es, 962-959. Mat Spencer's 250 and Tom Tavitian's 247 paced the winners.

Table champs. Israel Rosas (C) and John Leftwich (R) knocked off seven other table tennis teams on the way to doubles title at Plant 56, Glen Arm, Md. And to help note that achievement, General Manager George Kaye (L) was on hand to present championship trophies to the winning tandem.

No clipping their wings—they feel free in the sky

The ground seems to drop away as you soar into the air, no little kite strings binding you to mother earth. Then you are free as the plane glides into a sea of clouds on the routes of the birds. You have entered a totally new world.

"I have the fantastic feeling of doing the unnatural," says Dottie Zotter about flying. She is one of 27 women members of the Grumman Aerospace Corporation Employees (GACE) Flying Club, which began in 1965 as a renter organization until the purchase of its own aircraft in March 1970. The club, which boasts 285 members, now owns eight high-wing aircraft: four Cessna 150s, three Cessna 172's, and one Cessna 182.

GACE is one of the few flying clubs in the country to offer both FAA-approved ground and flight schools, which are conducted by authorized members of the club.

"Nothing is better than touring the country in a single-engine plane," exclaims Ellie McCullough. "The east is totally green . . . and as you fly west the ground begins to get browner . . . until you get to the purple mountains with their snow capped tops. Anything that catches your eye . . . like the Hoover Dam . . . or Niagara Falls . . . you can circle over and get a view that you can't imagine."

"When you fly, you can zip over to Block Island or over to Rhode Island," Betty Schledorn says. "It takes less time, and the ride is more exciting than driving."

Childhood ambition

Dottie and Betty joined the club to fulfill their childhood ambition—to fly a man-made bird. "It was a challenge, something I always wanted to do since I was a little girl," says Betty. "I was too busy raising a family to accomplish that dream, but two years ago, I felt I could afford it, so I joined GACE Flying Club."

Betty already has earned her private pilot's license through the club, and is presently pursuing her instrument rating. "I have to get in just a few more hours of night flying and then brush up on the books before I take the test." Once she gets this rating, Betty will be able to fly in inclement weather, something she can't do now with her private pilot's license.

A female pilot with 17 grandchildren, Betty is never short of willing passengers to share her love of aviating. "Every birthday I take each child up over Long Island," the flying grandmother said. "Of course, we **must** fly over their house and school yard."

Dottie is the first female member of the Flying Club to receive her private pilot's license under club tutelage. When she isn't manning (womanning?) the controls of a GACE Cessna, you might find her snow skiing. Though an avid fan of the ski slopes, Dottie does not care for winter flying: "The aircraft pre-flight check is just too brutal in the winter.

"Flying is never the same. I haven't had one take-off or landing that I handled in the same way," says Dottie.

"I never reach a point of over-confidence," she says, and still finds landing "to be the best test" of her confidence. Her stomach still "twitches" as she guides the plane in for a touchdown.

Weather does not seem to stop Ellie McCullough and "Schatzy," her own Piper Cherokee, from storming the blue horizons. Though she did not learn to fly with the GACE Club—Ellie has been flying for 27 years—she is a faithful member and firm supporter of the club. The club's activities and the informative monthly newsletter—and its stress on safety—draw Ellie to the club, not to mention "just being around people who love to fly."

The experienced pro of the skies has won numerous trophies for participating in air races such as the International Women's Angel Derby, the Powder Puff Derby, and several performance races, and also has 16 parachute jumps to her credit.

Time for a change?

Women pilots at Grumman? And why not? They don't fly F-14's, but the sky's the limit when they 'woman' the controls of eight planes belonging to the GACE Flying Club. Ellie McCullough (above) and 'Schatzy', her own Piper Cherokee, are veterans of national women's racing events. Betty Schledorn and Dottie Zotter (at right) check flight charts before take-off. Below, 'plane janes' associated with the club are shown gathered en masse in front of a GACE Cessna 172: (L-R) Sue Irving, Sue Steen, Ellie McCullough, Dottie Zotter, Betty Schledorn, Peggy Ford, Pat Ruvolo, Eleanore Franzese, and Agnes Kalemar, who is holding five-month-old Victoria Kalemaris. (Photos by Bob Settles)

"There is no better way to learn to fly than through the Grumman club . . . economically and safety-wise," says the holder of commercial, glider, and instrument ratings.

Someday, someday . . .

Has women's liberation penetrated the skies, too? The women pilots all agree that the men in the club, and all pilots for that matter, recognize talent and accept skilled pilots of the opposite sex as their equals in the cockpit, and all areas of flying. (That does not necessarily mean that they are not male chauvinists on the ground.)

"As far as the Federal Aviation Agency (FAA) and fellow pilots are concerned, women are just as equal as men in aviation," proclaims Ellie. "It is the general public that fears women in the sky . . . Men and women alike would probably faint if a 747 pilot got on the PA system and a feminine voice said sweetly, 'This is your captain speaking. . . .'"

Versatile system . . .

(Continued from page 2)

to require all vessels to use recycling systems with no sewage discharges, the Ozotherm system can be used in this manner.

"Another possibility is that the Coast Guard might decide to relax its standars for sewage discharges. As a interim measure it may allow a coliform count—the type of bacteria most commonly used as a pollution index—of only 1,000 coliform bacteria per 100 milliliters (which is about one-tenth of a quart.) If the Coast Guard does relax these standards, shipbuilders wouldn't have to buy the entire Ozotherm system; we could merely eliminate some components. Still, if the Coast Guard raises its standards, the shipbuilder can add the necessary components to meet the requirements. The result is that we feel we have designed a system that will meet any standard or requirement that might evolve."

Treats all sewage

Conforming with the Coast Guard's specifications, the Grumman waste-disposal unit is designed to treat all shipboard wastes, such as those produced by sanitary, bilge, galley, shower, and laundry facilities; to leave them free of odors, gases, or unsanitary conditions; to consist of components small enough to fit through standard-size ship's doors and hatches; and to withstand the rigors of rolling, pitching, and other ship movements.

Incoming wastes with an average rating for both suspended solids and biochemical oxygen demand (BOD)—the amount of oxygen required by bacteria in the water to consume organic materials—is 500 parts per million. After the waste is processed, the effluent which is discharged overboard will be reduced to 50 ppm. in both the BOD and suspended solids categories, which means an approximate 90 percent reduction of contaminants.

Under the terms of the Coast Guard contract, the system is being developed in three stages: first, extensive feasibility testing, completed last June; second, prototype fabrication and three-month on-shore testing, to begin this month; and last, a six-month shipboard suitability test, for which the unit will be installed in October on the USCG Manitou, stationed at Governor's Island, N.Y.

The Grumman prototype is now being tested in a series of trailers near Plant 3 in Bethpage. Program manager is John Mikals, a 21-year veteran with the Company, who has worked in the Environmental Control Section and was formerly responsible for the water treatment in LM.

"There aren't any off-the-shelf waste-disposal systems that meet present shipboard needs," Mikals says. "A number of companies are doing development work now but most of the innovations currently installed on ships are prototypes, all custom jobs. One advantage Grumman has is that shipboard installations have similar constraints—such as weight, power, and volume—to those on airplanes and spacecraft. Grumman has a lot to offer in this respect since many systems we have designed before have had similar restrictions."

At Grumman's test facility, sea salt is mixed with sewage to simulate shipboard wastes. Raw, fluid sewage contained in a holding tank enters the system through a hydroseive, where screens strain solids and deflect them into an incinerator. The liquid enters a surge tank and is pumped to a centrifuge from which large solid particles are separated. A second "disc" centrifuge spins even faster to remove fine particles; they are also sent in the form of sludge to the incinerator. The liquid then flows into a 12-inch-diameter ozone reactor column where the ozone bubbles up through the column to further remove suspended and dissolved solids, and to kill virtually all the coliform bacteria. The final liquid, now with 90 percent of its contaminants removed, is pumped over the side of the ship.

Why ozone? "Our system is designed to operate in fresh, brackish, or salt water," explains Mikals. "One type of disposal system now used on ships chops up sewage, introduces chlorine as a disinfectant, then discharges the effluent overboard. Unfortunately, the generation of chlorine requires salt water, which in itself restricts the use of this type of system in other environments. Chlorine is a good disinfectant but as far as we can see, it isn't very efficient in removing BOD. Ozone, of course, operates any place, removes a substantial amount of BOD, is a powerful disinfectant, and requires no chemical additive. We looked at a number of different types of techniques and felt that this one suited our needs best."

Grumman's waste-disposal system offers unique advantages for both land and sea applications. Only time will tell how things will actually work out, but the system seems to be off to a good start, according to its most enthusiastic salesman, Vin Rau. In fact, Rau can find only one thing wrong with the system: it often encourages his closest associates to become humorists.

"There aren't any jokes about this business I haven't heard," he says with a grin. But humor or not, a waste-disposal system which may have almost universal application may someday prove that man—in one way, at least—has found a new way to improve his environment.

Top savings. President Joe Gavin and Vice President George Skuria were on hand to present Project Sterling awards to Jack Patton (2nd R) and Frank Davies, cost-reduction coordinators for Product Engineering. Of a total corporate savings of $53.4 million, Product Engineering reported top Company savings of $23.8 million—about $6 million more than last year's department total. (Photo by Marie Trimborn)

service milestones

W. R. Bischoff — A. O. Keech — R. F. Mohrman — J. H. Rogers Jr.

T. L. Keller — F. P. Galgano — J. H. Combes

(Continued from page 6)

Augustine J. Lanzo, Training & Devel. (39)
Jacques Caffrey, P/S, A/C Syst. Serv. (90)

15

John S. Capelluto, Prod. Cntrl. - Parts Ctl. (1)
Dorothy L. Lambert, Repro. Serv. (1)
Stephen R. Hambsch, Ops. Anal. & Plng. Research (5)
David F. Gebhard, Adv. Aircraft Syst. (5)
Alfred P. Korte, Support Equip. Prod. (6)
Harold D. Carter, Maint. - Rearrange. (6)
George W. Wilson, Plant Protect. (18)
Arthur L. Barry, Adv. Space Syst. (25)
William B. Haynes Jr., Alight. Gear/Arm. - Pyrotech Syst. (34)
Louis B. Popovich, Proj. Engg.-Veh-Tech. (34)
Robert Geist Jr., Prod. Cntl. - Parts Cntl. (36)

More on bowling . . .

(Continued from page 11)

together 200-572 a week earlier. Among other top efforts were Rita Mathia's 527, Peggy Griffith's 500, George Bunzel's 579, Rob Ogilvie's 566, and Anna Wicks' 489.

And speaking of records, Ed Frank finally got it all together, stepped into the spotlight, and socked the sticks for 225-603 as he paced the Cellar Dwellers to 770 and 2,204 for new league highs. Following that, Leslie Coursen shattered both women's marks with 221-202-580. Also on the high-scoring list were Don Curran, 213-532; Joe Nagle, 211-537; Joe Baer, 212-553. . . . Don Eivers' 212-586, Joe Glasser's 557, Lenore Seip's 533, and Carol Mayer's 521 were standouts in Woodury Mixed play, but the big winner was Dot Eivers' 225, a women's record in the loop.

Wanted

APT.: If poss. in Lynbrook, Rockville Centre, Baldwin, Malverne, E. Meadow, or within 5 mi., 3 rm., occup. May. After 6 p.m. CU 5-7162.

Car Pool

ROCKY POINT/MILLER PLACE: To Plt. 5 or 25, to start new or join, 744-8065.

For Adoption

CAT: Siamese, fem., pure bred. 271-1364.

For Rent

HOUSE: Williston Park, avail. April, comp. furn., 3 bdrms., 1½ baths, washer & dryer, 2 blocks to bus stop, parochial & pub. school. $350 mo. Call wkends. PI 2-9869.

ROOM: Hicksville, furn. pvt. 935-2466.

BARN: E. Northport, small, 18 ft. x 20 ft. w/ loft, $25 mo. 757-3430.

APT.: Two (2) room, pvt. entr., bath, own thermo., newly decor., Franklin Square area. 825-3962.

GAR. APT.: North Shore, unfurn., suit 1 or 2, auto. gas heat, gar., storage space, $140 mo + gas & elec. 922-0649.

APT.: W. Babylon, mother-dght., immed. occup. 731-4187.

ROOM: One mi. S. of Grumman, furn., kit. priv. PY 6-4210.

ROOM: Near Grum., pvte. entrance, lge. newly decor. Evgs. 822-6729.

APT.: Farmingdale, 3½ rooms, utilities ex., pvte. entr., occu. March 1. After 3:00 pm. 293-5537.

MOTOR HOME: 24 ft. Winnebago, sleeps 6-8, self-contained, reason. rates. 724-7504.

HOUSE: Pocono Mts., 2 bdrm., kit., dng. rm., lvg. rm., reasonable rates. After 6 pm. LI 1-5177.

CHALET: Stowe area, adjac. to Stowe-Morrisville Airport, A-frame, sleeps 6, avail. week-days only. Contact Denise, Ext. 7311.

COTTAGE: Housekeeping, Loon Lake in Adirondack Mtns., pvt. beach, boats, horse shoe ct., badminton, $65-$85 wk. For reserv. 271-5886.

For Sale

MISC. EQUIP.: Racing slicks on rims for Chry. - Ford; $30; M&H air shocks for Baracuda/Chall, $25; rebuilt pwr-glide for Chevy, 62-70 alum., $50; misc. racing equip. for Chrysler products. Evg. (212) 347-6516.

DIN. RM.: Blond oak, tbl. 2 leaves, 4 chrs., buffet, china closet, $75. PI 6-1597.

KITCH. SET: Tbl., 4 chrs., xtra leaf, grey chr., $30. JU 1-3125.

BABY FURN.: Walnut Storkline crib w/matt., $20; "port-a-crib" w/matt., $15. 928-2743.

FISH TANK: 10 gal., w/access., $30. 731-5279.

TRAILER: '71 Travel 23 ft., fully self-cont., used twice, hitch brake control., trans. cooler, etc., $2,850. 757-2378.

TRAILER: Apache tent, w/add-a-rm., $500. LT 9-2979.

MINI-BIKE: '72 Rupp Hustler, 4 hp., torque converter, $175. 732-6034.

TIRES: two f78x14 supper 120 nyl., mount on rims, $30; VW roof rack for bug, $10. 732-7129.

BORGWARD: '60 Isabella, ts, 4 cyl., $100. 922-0740.

LINCOLN: '59 Continental, white, new bks./tires, ask. $400 or best offer. 226-7725 after 5 pm.

VW: '70 tan bug, new tires/muff., ski rack, $1,175. 728-2772, evgs.

FIREBIRD: '71 Esprit, grn., 2 dr. w/decor group, 350/280 eng., manual, am/fm, wide oval tires & mag wheels, 20,000 mi., $2,600. 293-7811.

CADILLAC: '67 Sedan DeVille, all pwr., a/c, $1,700. 587-4282.

CHEVELLE: '69 hdtp., p/s, vinyl tp., 307 eng., pwr. glide trans., ask. $1,100. 698-2764.

CHEVELLE: '70 Super Sport, 29,000 mi., 4 spd., posi-tract., buck. seats, 396-350 eng., gold w/blk. stripes, balance of warr., $1,800. 666-7841, after 5 pm.

CADILLAC: '65 sedan DeVille, reasonable. 585-3169.

FORD: '69 Fairlane, auto., 2 dr., vinyl roof, $1,050. 466-9739.

LESABRE: '65 Buick, 4 dr., r/h, a/c, p/brks./steer., ask. $100 or best offer. MY 1-2636.

For Sale

VW: '71 Super Beetle, marine blue, am/fm, stereo, snows, stick shift, $1,550. 433-1452, after 5 pm.

COMBINATION: 25 in. color TC, stereo radio, am/fm, phono (Olympic), new tube. (212) 525-1768.

DINETTE SET: Heavy wrought iron, marbleized formica, 36 in. round table w/ 2 leaves, 4 scroll back iron chrs., $45. 489-2306.

HOUSE: Wantagh, 8 rm. split, 3 bdrms., 2 baths, gar., all appl., patio, a/c, xtras, $41,500. 9 am-2 pm all Sat. PE 5-9835.

TABLES: Cocktail w/ glass custom design; lvg. room commode, slate inlaid top; misc. acces. After 6 p.m. (212) 974-5829.

PROPERTY: Riverfront, Delhi, N. Y., 15 acre vaca. site, roll, acreage fronts on Delaware for approx. 300 ft., on mail & school bus routes, 2 mi. outside of town, terms availa. on price of $8,500. After 6 p.m. MO 1-3868.

OLDS: '64 Cutlass conv., 330 CI V-8, new trans., 72,000 mi., $400. 223-0117.

WHEELS: Pontiac, 800 x 14, (2) $10. 928-2366.

For Sale

VW: '68 pop-up van, all facil., green. Ask $2,000. AN 1-2572.

BOAT: '69 Sportscraft fbgls. cabin cruiser, 27-ft., twin 160-hp Mercruiser inbd/outbd. eng., depth find., a-m, sniffer, synchron., dinette, recessed sink & stove ,refrig., fresh water tank, sleep 4, bow & stern rails. $7,500. 421-5589.

VW: '67 Beattle, 2 mounted snows, new tires, $500. 473-6379.

SKIS: Men's 6 ft. Cubco bdgs., size 9 buckle's Hanke boots & poles, $50; women 5 ft. Cubco bdgs., size 6½ boots & poles, $25. MO 9-2892.

HOUSE: Islip Terrace, 3 bdrm. ranch, fin. bsmt., mother/dght. apt., pvt. ent., w/w thru out, ¼ acre corner, 24 ft. enclosed pool, $45,000. After 2 p.m. 581-1264.

MISC.: Dec. sink, marble shell top, red base, $75; gold velvet rocker, $35; mod. hutch, $65; 6 x 9 sunburst area rug, $50; 36 in. sq. wood country french coffee table, $25; Edison crib, white, gold trim, new matt., $50. 334-0735.

at your SERVICE

This is a free service to Grumman personnel for non-commercial advertisements, accepted on a first-come, first-served basis. Classified advertisements are carried in PLANE NEWS only on the basis that everyone replying to such advertising will receive fair and equal consideration regardless of their race, creed, color, or national origin.

Type or print ad on form available at Employees Service and Engineering counters, and send via interplant mail to PLANE NEWS, Plant 5, Bethpage. List home phone (with area code if outside Nassau or Suffolk). Limit: one ad per person per issue. No item under $10, no firearms or ammunition.

COUGAR: '68, 427 4-spd., a/c, p/s, am/fm, $1,595. 698-4529.

HOUSE: Cape Cod, 4 bdrm., 2 car gar., fin. bsmt., patio, Breezeway Massapequa, $37,500. SU 1-1432.

ENG.: Winco port. gen. Briggs & Stratton, 1000 watts. $100. Evgs. 427-6359.

REFRIG.: Hot Point, 42 in. x 25 in. x 15 in. freezer, Hot Point, 42 in. x 22 in. x 20 in., best offer. PY 8-4322.

HOUSE: Hunt., mother/dght., sep. ent., 3 room apt., dng. room, pan. bsmt., 3 zone o.h.w, sun deck, patio, 80 x 250, $43,500. After 4 p.m. HA 3-4462. Occup. July.

CHRYSLER: '66, '300', 2 dr., yellow w/ blk. vinyl, auto, all power, snows, fac. manual, $600. 433-6951.

BOAT: '71 Chrysler Crown, 85 hp, power tilt, compass, bilge pump, two 6 gal. tanks, new canvas, $2,500. Pat, Ext. 84017.

SAILBOAT: 19 ft. Lightning, #4711, all wd., 2 sets of sails, spinnaker, s/s rigg., new paints/canv. tp., $800. 724-1831.

BOAT: Chris-Craft 18 ft., 95 hp, inbd. eng., navy top, cush., $800. 589-9392.

BOAT: 28 ft. Pearson, fbgl. express cruiser, '67 FWC Palmer 265 hp., hdtp., control, elect. trim. tabs, fathometer, Corsair comp., all eng. intsr., 90 gal. gas, 50 gal. water, full bow rail & lifelines, many other extras. AN 1-0134.

ENLARGER: Beginners, 50mm., F-35 lens, makes up to 8 x 10 in., $12. HA 7-5057.

MISC.: Shower base, brand new, 32x32, white 'modulite' fbgls. for corner, $25. MY 1-5948.

MISC.: '67 Corvair eng., 110 hp., $25; tires, Good year G60's fbgls., two, $85; rims, two Chevy chr. wheels, 14x8, $30; ski boots, size 10. WE 8-0617, after 2 p.m.

DRUM SET: Champagne, tom-tom, snare, flr. tom, bass, hi-hat, stool, cymbal. 781-0671, Sat. only.

SURF BD.: 9 ft. 6 in., $30. MO 9-2892.

GRIND. MACH.: Heavy duty, sharpens lawn mowers, lawn nmower parts incl., $450. Frank De Rosa, Ext. 3758.

KITCHEN: Cabinets, oak, 144 in., form. tp., cutout sink/range, 667-2320.

STAIRS: Wood, 11 risers, primed/painted, for sundeck or basemt., never assemb., treat. w/preserve. 667-2320.

STEREO TAPES: Large collection, 8 trk. cart.; rock, jazz, etc. 543-6341, after 6 pm.

MISC.: White baked enamel cross buck storm door, 32x80, screen/frame, $25; Caloric stainless steel counter tp. gas burn. unit, 20x28, $50. 667-9733.

TV/STEREO: Color, am/fm, combo, sliding doors, cont. style, new tube, $350. Ext. 75618.

CHEVELLE: '66 conv., Z83 V-8, stand. trans., conven. brakes & steer., r/h, am., $300. AN 5-8257.

PIANO: Mathushek 'square' grand w/ bench, needs tuning. Ask $500. IV 1-6247.

TIRES: 2 Dunlop snows, H 78-14 w/w on GM rims, $50. MO 9-2892.

VW: '67 van w/ '69 rebuilt eng., new brake & batt., $850. JU 8-3075.

MISC.: Dog house, insul., for med. lg. dog, $30; 3 ft. x 100 ft. fence wire, $25; 7½ ft. sofa, $75; 4 wood chrs., $20. 588-6364.

MARINE EQUIP.: Johnson '71 outbd. motor, used 9 hrs., $175; 7 ft. "Moby Dick" dinghy w/oars, $75; 100# Mooring, $25. WA 1-4686, evgs.

VW: '62 conv., Corvair eng. & transaxel, many xtras, nds. minor work, $250. 691-0905.

ENGINE: 215 hp. Gray marine, V8, excel. for parts & excess, $125. MO 9-6256.

TENT TRAILER: Apache Mesa '67, sleeps 6, full canopy & screen rm., xtra storage, $450. MO 9-9369, after 5 pm.

CUTLASS: '67, V8, auto. trans., p/s, p/b, new tires, $900. LT 9-1496.

CAMARO: '70 Super Sport, 350 cu. in., 4 spd., p/s, p/b, am/fm, $1,800. 598-0072.

AUSTIN HEALEY: '68 Sprite, hdtp. & new conv. top, r/h, 30 mi/gal., $967. 727-6525, after 5 p.m.

BOATS: '71 O'Day Daysailor 11, inside stor., tab. berth cushions, 4 in. compass, access., 4 hp. Evinrude motor & cox trail., $2,750; '65 14 ft. Glaspar Marlin runabout, '68 Johnson elec. 40 hp. eng., little dude tilt trail., $750. PY 6-8615.

HOUSE: Massapequa Park, Dist. #23, 80x100, 3 bdrm., 21 ft. liv. rm. w/firepl., ww, att. gar., 15x17 fam. rm. w/bar, 18x26 patio, all appli., dishwash, air cond., low taxes, walk to RR & shops, $39,990. PY 8-4005.

MISC.: Speakers, Jensen 8 in., $10; University 8 in. woofer, horn tweeter & crossover, $15; RJ Bookshelf cab. & skpr., $15. IV 1-6247.

TIRES: Two Goodyear, c78x14 on GM rims, $35. 826-1345.

SKIS: Hart Holiday, 6 ft. 9 in., bind./poles, $75; Munari boots, size 11½m, w/carr., $25; Vibram boots, size 12, $10; bathrm. sink new, compl. w/ faucets, $50; lawn mower AMC 21 in. reel, $35; door, cross buck w/9 lites of glass, lock, $60. 567-3567.

IMPALA: '64 4 dr. hdtp., 61,800 mi., auto. trans., pwr. steer., blue, $425. MU 2-7320.

For Sale

CAMERA EQUIP.: Linhof 4x5 super Technika, triple ext. bellows, univ. back., fr. & bk. swings, tilts, rangefind., graphic view find; Schneider Xenar lens, 150 mm, f4.5, Compur M-X shutter, 1/400 sec., sync. to rangefind., 12-4x5 doubl. cut film hold, 3 grafmatic cut filmhold, 1-4x5 Polariod film hold, case, instruct., $300; 1 Goerz golden Dagor lens, 8.25 in., f6.8 in. Compur M-X shutter mount. on lens bd., not sync. must focus on grnd., glass, $185. 586-0757.

SPEAKERS: Two Rectilinear mod. LLL cons. 6 way syst.; Garrard Zero 100 auto. turntbl. w/Shure v-15 type II cart., Viking 8-trk. record/playback deck., 1 yr., $500. IV 1-0825.

PUPPIES: Irish setters, 3 mos., champ sired, shots; wormed, dew clawed, home bred w/child., part. train, reasonable. 588-2868.

CARRIAGE: Coach, $35. 822-1263.

MUSTANG: '66, blk., $80; Eddlebrock ram log manifold for sm. blk. Fords w/linkage, $75; '68 BSA victor spec., 441cc, $500. SU 1-7219.

BOAT: '72 Winner w/140 Mercury eng., trail., 19 ft. 864-5429.

HOUSE: Farmingdale, colonial, 3 bdrm., eat-in kitch., fin. basemt., gar., full din. rm., front sun rm., screen back patio, ohw bsbd., walk up attic, nr. trans. sch. dist. 22, low taxes, $34,500. CH 9-9313, after 4 pm.

BED: Day-bed, 33x75 w/bolst./slipcovers, $60. 692-4277.

HOUSE: Farmingdale, ranch, brick, 3 bdrms., kitch., din. rm., w/w, fin. basemt., new refrig./stove in main kitch., s/s, gar., $34,500. 694-1090.

FURN.: Maple 8 ft. couch, chair, barrel swivel chair, coffee table, end table, $75; maple dress. w/5 draw, $25; chest of drawers, $25; 3 bar stools, $15; easy mangle, $10; 2 turn of cen. chandeliers, $25 ea.; 4 drawer student desk, $15; filing cab. w/2 letter size draw., 30 in. wide, $25. TN 8-7224.

WASH & DRY: Port. Kenmore, 10 lb. cap., $225 both. After 5 pm. JU 1-5552.

DISHWASHER: Kitchen Aid Superba, '70 mod., $65. 864-1549.

COUCH: 3 piece over-size sec. contemp, $275. 588-5163.

CHAIR: One barrel back tapestry, $25; drum table, $15. 931-5229.

CAMERA: Yeshica-eim, 2¼ sg. twin lens, reflex 80mm Yashiom F3.5 len, flash sync., shutter, shutter spds. 1 sec. to 1/500 sec., $45. 472-0823.

VW: '69 bug, 37,000 mi., rebuilt eng./no mi., dk. blue/wht. int., $1,095.

HOUSE: Lindenhurst, ranch, 4 bdrms., 2 baths, den w/firepl., att. gar., w/w, all appli., 226-9076.

MISC.: 30 in. gas stove, 1 yr., $50; two 14 in. snow tires/Comet, $20; two 14 in. polygl. tires J78-14, $30. 757-3430.

DODGE: '66 Monaco, a/c, r&h, p/s, new trans., $650. JU 6-1765.

DRUMS: Rogers, base, chr. snare, toms/one on floor, two hi-hats w/stand, bl. spark. pearl, all plastic heads, ask. $375. HA 3-5399.

REFRIG.: Philco 15 cu. ft., 2 dr., bott. freezer. frost free. PY 9-8831.

CAMARO: '67 conv., cyl., r&h, auto. trans., 2 snows, $750. 798-0009.

TRAILER: Norris, 25 ft., '69, sleeps 6, compl. bath, gas/elec. refrig., 4 burner stove/oven, ss doubl. sink, f.a. heat, $3,000. JU 6-7356.

MISC.: Ital. prov. 6 ft. stereo cab., $125; 3x100 ft. fence wire, $25; 7½ ft. sofa, $75; 4 wood. chrs., $15. 588-6364.

WASHER-DRYER: White, used once, must sell, $200, both. 585-8998.

CAMERA EQUIP.: 35mm slide trays, Yankee r-w36 fits most proj., 27 for $12. 367-3142, after 6 pm.

CARRIAGE: Baby port., car bed/carr., $10. WE 8-8755.

SAILBOAT: Pearson Electra, 22½ ft., main, jib, genoa, spinnaker, 6 hp outbd., 822-5472.

HONDA: Mini-trail, 50cc 3 spd. gear box. 249-5392, after 5 pm.

BOAT: Glasspar Cutlass 16 ft., Chrysler, 75 hp, outbd., holeshaw trail., best offer. 864-4698, after 6 pm.

MINI-BIKE: Rupp Srambler, w/helmet, $150. HA 7-3187, after 4 pm.

DRUMS: Kent pro set, spark. blue, bass, snare, high hat, tmo-tom (2) cymbals, stool, ask. $150. PY 6-4933.

REFRIG.: Frigidaire, 12.2 cu. ft., 2 dr., top freezer, best offer. 333-0637.

JAVELIN: '71, 6 cyls., 3 spd syncro., 30,000 mi. $1,500. 567-0342.

For Sale

CAMPER: '72 Apache "Mesa", solid state, sleep 6, dinette, full equip. galley, ex. storage cab., hitch "B", spare tire & wheel. WA 1-02227.

GTO: '66, red, 4 spd, new shocks & tires, valve job done, chrome valve covers & air clean. $950. MO 5-6914.

NOVA: '70, V8, 2 dr., 3 spd. floor shift, green/dk. green vinyl roof, green int., r/h, $1,400. 661-1855.

WILDCAT: '65 Delux, fact. a/c, p/s. p/b, snows, $595. 744-8952, evgs.

STEREO: Lafayette 70 watt, am-fm receiver, model #LR-800, all inputs/outputs, $65. 935-5384.

DINING RM.: '35 mahogany, contemp., 4 pcs., 1 tbl., six chrs., ext. leaf, 2 buffet, 3 break front, 4 server, best offer. 212-531-3619.

SPREAD: Bed, pink satin. match. drapes, 2 pr., $35; boys 24 in. bike, $10. HA 3-2614.

TIRES: Town & Country, 2 - 845x15 Firestone, ww, unmount., 1,000 mi., $35; air cond., 5,000 btu, Philco, 3 yrs., $70; 4 hp Mercury outbd., '72, 10 hrs. old, long shaft, $225. LI 1-5407.

BOAT ENG.: G.M. diesels, two 451, 87 hp ea., small boat, $895. HR 2-1706, after 5:30 p.m.

BOAT: '66 29 ft. Ulrichson sport fisherman, flybridge, 238 hp fresh water cooled Gray motor with 300 hrs., closed bulkhead with palousie windows, dinette, kitch. sleeps four, compass & depth find., all lights, xtras. V. Bambola, Ext. 9469.

HOUSE: Centerport. 3 bdrm. ranch, all elec. app., w/w, 2 full baths, part. fin. bsmt., s/s, dng. area, gar. $44,500. After 6 p.m. 421-5984.

SKI RACK: Martin's trunk type, used twice. Ask. $10 Roger after 5 p.m. 433-5694.

SAILBOAT: 23 ft. O'Day Tempest, fbgls. keel sloop, sleeps 2 + 2, head, 6 hp outboard, boom tent, cushions, dacron sails. $2500. 727-8961.

FURNITURE: Fruitwood French Prov., coffee table, 2 end tables, 3 lvg. room lamps. Evgs. 751-4982.

BOAT: '60 Shoup outboard, 18 ft., 50 hp '66 elec. start Mercury, fully equip., 2-6 gal. tanks, summer cover inc., side curtains. $900. PY 8-6382.

MISC.: Barrel back tapestry chair, $25; one drum table, $15. 931-5229.

MOVIE CAMERA: Yashica "U", reg. 8mm, elec. zoom, auto exposure, $30; Argus 500 reg. 8mm proj., $30. Both $50. IV 1-6247.

PUPPIES: Irish setters, 8 wks., A.K.C., deep red. $100. 364-1935.

VW: '66 Beetle, rebuilt eng., orig. owner. After 5 p.m. 265-5118.

SNOW TIRES: 825 x 14, 2 for $25; 2 4-ply nylon 825 x 14 tires w/rims, $30. TU 8-7931.

CADILLAC: '69 Fleetwood Brougham, a/c, gold/white vinyl top, 35,000 mi., $2650. After 5 p.m. CH 9-7584.

PONTIAC: Wagon, '68, 9 pass., auto trans., all power, snows, $1100. AN 1-2985.

GUITAR & AMP: Kent guitar, 3 pick-up, encore amp, $80. 368-2939.

MUSTANG: '66, red w/black vinyll, V-8, 4 speed, disc brakes, new clutch, exhaust system, air shocks. $850. 735-8820.

ENCYCLOPEDIA: '54 Ed. Britannica, 24 vols., Atlas plus yearbooks '55-'69. $225. 543-6374.

MISC.: 14 ft. clam tong, $45; 26 in. Schwinn bike, $60; 20 in. gold Sears bike, $50; 40 hp Johnson '60, $50. After 5 p.m. 666-8967.

TRIUMPH: '68 Spitfire, new snows. $600. CH 9-7703. After 5 p.m.

SOFA BED: Sleeps two, brown, $60. PY 6-8687.

OBITUARIES

Plane News has received word that death has come to the Grumman personnel listed below. We extend sincere sympathy to relatives and friends.

ANDREW BACON of Prototype, Plant 2, died February 5 at the age of 56. He had been with Grumman nearly eight years and lived at 79 Schoolhouse Rd., Levittown.

GEORGE H. MESSLER, a Field Service Representative based in Naples, Italy, died February 10 at age 50. He had been with Grumman since 1968.

BERNARD A. HILL, captain of Plant Protection, Plant 18, died February 18 at the age of 60. He had been with Grumman over 31 years and lived at 490 S. Delaware Ave., Lindenhurst.

For Sale

HOUSE: Lake Grove, 3 yr. old, 4 bdrm., col., 24 ft. center hall, 2½ baths, laundry, 2 car gar., fenced, patio. full bsmt, indscpd., 1/3 acre. Make offer, $40's. 588-6366.

VALIANT: '60. 4 dr. sedan, slant 6, r/h. $100. 676-3805.

DUSTER: '71, 6 cyl., stand., deluxe interior. $1850. 666-9370/581-0403.

TRAILER: Travel, '71 Lancer, 17 ft. fully self-contained, sleeps 6, hitch, brake control, mirrors, spare tire, awning, $2400. After 4:30 p.m. 888-4662.

PROJECTOR: TDC Showpac, 35mm & 2x2 slides, Airequipt Changer, $10. WA 1-2978.

VW ENGINE: '68, 53 hp, completely rebuilt & install. $225. 273-6239.

SHOWER DOORS: Glass, Sears for 5 ft. tub, mounting hardware includ. $22. 681-7338.

PUPPIES: German Shep., A.K.C., lge. boned, import., champ. bred, sire & dam w/obedience titles. 732-3552.

ELEC. RANGE: Hotpoint 30 in., coppertone, $30. After 5 p.m. 928-0936.

HOUSE: Stony Brook-Strathmore "S" Section, ranch 4 bdrm., den, firepl., s/s, full carpet., 2 car gar., appl., fenced, wooded 1/3 acre. $39,990. 751-2513.

MISC.: Early Amer. cocktail table; end table lamp attach.; spinning wheel, 6 ft. Xmas tree, 3 sets outdoor lights; lawn mower bag att. elec. hedge-clipper; boy's winter & spring jackets, size 16 - 18. 884-2145.

HOUSE: Selden, 3 bdrm., 1½ bath, paneled den, ½ bsmt., lge. kit., dng. area, w/w, fenced, indspd. $29,500. After 6 p.m. 732-5954.

HONDA: Mini-trail, 50 cc, 3 spd. gear box. $175. 249-5392.

FORD: '69 Galaxie 500, V-8, all power, auto, snows. 39,000 mi. $950. 483-2154.

MISC.: Men's hockey skates, size 8, $5; baby carr., car bed, table seat, etc., $15; small Saber saw, $10. 277-9568.

HOUSE: Massapequa Park, school dis. 23, 3 bdrm., dng. rm., lvg. rm. w/firepl. 15 ft. x 17 ft. fam. room w/bar. 18 x 26 concrete patio, dishwasher, air cond., all appl. $39,990. PY 8-4005.

TRAILER: Emeryson, F/C, front engine, front drive, B.M.C., "A" series, VW trans., SCCA logbook, spares, Ask $1295. 421-5274.

OUTBOARD MOTOR: 40 hp, '71 Mercury, manual start, remote controls, two 6 gal. tanks, $425. CH 9-4087.

DRUMS: Ludwig, toms toms, snare, bass, high hat, cymbals, case covers, seat, $350. 423-3609.

MISC. FURN.: Two piece mod. sec. sofa & two chairs, $100; walnut hexagon comode, $40; 40 in. round walnut coffee table, $40; walnut a.m./f.m. stereo, phono console, $85. 226-1238.

HOUSE: Setauket Col., 3 bdrm, 1½ baths, fam. rm., paneled playroom, dng. rm., lge. kit., d/w, w/d, 2 car gar., 1/3 plus acre treed, $46,000. 751-1089.

TIRES: Snow tire, 695 x 13; 2 rims, 13 in., GM Chev., 2 rims, 14 in., GM Chev., total $13. MO 9-4278.

MISC.: Skis, 6 ft., boots buckle, size 7, poles & bindings, $50 all; redwood 6 ft. table, 2 benches, 2 in. thick, $35; drapes, dble. width, $20, triple width, $30; Sears Kenmore wash. machine motor & timer, $15; lge. wall mirror, $15. 921-3192.

MISC. FURN: Mediterranean dng. rm. set, parquet top, solid oak, 2 leaves, table pads; 4 chairs, velvet cushions, wrought iron chandelier incl. After 6 p.m. (212) 741-1364.

CHEVY: '67 Biscayne, 2 dr., needs engine work, $150. After 5 p.m. 585-9639.

MISC.: Movie camera, Kodak Escort 8, 13 mm F/1.6 lens, Sunset single beam movie lite, mod. no. 8500. $45; portable organ, Kalamazoo, full key board, $350. 727-5598.

VW: '69 Bug, gr. w/ white int., r/h, auto-stick shift trans., rear wind. defrost., $950. After 5 p.m. 666-0979.

CORTINA G.T.: '65, $125. 935-4467.

MISC.: 2 colonial beds w/ mattresses, boys, $100; flor waxer, Sears, $10. 938-6140.

MISC.: Sears, black, elec., 2 control fireplace, $50; Magnus, play by number organ, $50; mix master, juicer & meat grinding attach., $15; G.E. 17 in. b/w port. T.V., $20. 694-7349.

HOUSE: Massapequa Park, 3 bdrm., split ranch, lge. den, alum. siding, fenced area, w/w, all appl., extras, $42,000. 799-0004.

VOLVO: '67 Sedan, equip. w/ Michelin XAS steel belt rad. tires, 4 spd. stand. trans. 822-4553.

For Sale

MISC.: Dng. set, antiqued mahog. drop-leaf table on pedestral, pads, 4 chairs, $200; match, antiq. buffet, $175; corner cab., $100; area gold shag rugs: 4 ft. x 6 ft. & 6 ft. & 8 ft., $25; biaxial base-reflex enclosed speakers (2), $50; ski equip.: lace boots, lady's size 8-8½, $10; man's size 12 med., $10; 2 pr. wood skis w/ cable bind, len. 180 cm, 205 cm, $15 ea. After 6 p.m. 924-4616.

FREEZER: Upright, Zenith, 18 cu. ft., $150. 724-4659.

POWER HANDLE: Toro & snow blower. 822-1127.

VW: '69 bug, $875. 671-0517.

DRUMS: snare, base, 2 tom tom, $150. 671-0517.

RECORDER: AKAI (Roberts), Mod. M-8 Stereo, 4 track, 4 spd., cross field heads, sound-on-sound. Ask. $160. After 5:30 p.m. 293-9729.

CHEVY: '69 Suburban, 4 wh. drive, new tires, 4 spd. trans., 307 V-8, warmerhubs. $2150. 281-8063.

CHEVY: '63 Impala, new trans., batt., tries (2), needs work on engine, $175. 231-6367.

WOOD TABLE: Solid cherry, gate leg, drop leaf, 46 in. x 27 in., custom made pads. After 5 p.m. 589-9252.

FIAT: '71 Spider, yell. conv. 850, 38 MPG, 1700 mi. Ask. $1495. After 5 p.m. 981-2095.

Chevelle: '72, 4dr. sedan, dk. gr. w/w, auto, 307 V-8, 12,000 mi. $2400. 567-2287.

BOAT: Jersey Skiff, 28 ft. fly bridge, '66 Chrysler motor, depth find., radio. $4000. After 5 p.m. SV 1-7696.

CHEVELLE: '67, 369 eng., 325 hp, blue, posi-rear, 4 spd. new mags. Ask. $800. 264-5029.

BOAT: Sail, 28 ft. Triton fbgls., '64, full set sails, atomic 4 rebuilt '71. $9,500. 757-2684.

CHEV.: '66 Impala, 4 dr., auto trans., 283 C.I.D., 5 new tires, 4 brll. carb. $500. After 5 p.m. 483-4439.

POOL TABLE: Bumpa, 3 ft. x 4 ft. w/ ¾ in. slate top, formica sides, repair kit for cue stick, $200. After 4 p.m. WE 8-3175.

BOAT: '68 Pembroke 33 ft. fly bridge twin f.w. Palmer 210 hp, radio depth finder. Evgs. 581-3018.

CAPRI: '72, 2000 series, am/fm, Panasonic tape deck, 4-on-floor, console pkg., $2250. After 5 p.m. 581-3731.

HOUSE: So. Great River. 9 rooms, 5 bdrms., 3 baths, den, fireplace, full bsmt., 12 yrs. old, ¾ acre near water, possible mother-dght, $57,500. JU 1-4707.

BEDS: 3 metal frame w/ mattresses, single size & ladder, 4 yrs., $35. 473-6471.

REFRIG.: 14 cu. ft., old, $20. 271-9097.

BOAT: 18 ft. runabout w/ 55 hp Homelite outboard, 2 yr. trailer, access., $750. 628-1083.

FURN.: Bedroom, solid mahogany, 72 in. dresser & night staand w/ glass top, $50. 334-7107.

CADILLAC: '69, 37,000 mi., factory warranty good, grey w/ whte. vinyl top w/ whte. leather int., aa/c, am/fm, 6 way seats, all power, tinted glass, new tires, brakes, snows. After 6 p.m. IV 5-1788.

HOUSE: 5 mi. south of Plt. 5, 3 bdrm, lvg. room w/ fireplace, dng. room, eat-in-kit., fin. bsmt., large lot, low taxes, $39,500. SU 1-5170.

CAMPMOBILE: VW, '70 white, pop top, gas heater, am/fm, carpet, $2700. 751-9206.

KILN: Skutt ceramic, 18 in. high, 17½ in. dia., all access., $100. After 5 p.m. TU 4-3032.

MISC.: Chandelier, 6 arm lights, solid brass & crystal, $30; 2 Danish mod. armchairs, $15 ea.; crib; 2 carriages; playpen; changing table; guard rails, etc. 921-6470.

JEEP: '66 Universal, extras, $1,450; '66 Imperial full equip., $850. SU 1-2992.

APPL.: '60 G.E. 12 cu. ft. refrig., $95; '60 Westinghouse wall oven counter range, $55. RL 7-0127.

HOUSE: Commack, 3 bdrm. ranch, w/w, s/s, patio, full bsmt., 5 appl. Immaculate. After 6 p.m. 864-3709.

PONTIAC: '67 Firebird 231 OHC, new engine, $1,200. After 5 p.m. 757-3178.

MUSTANG: '70 Mach I, Cobra Jet 4 spd., new tires, $1,700. After 1 p.m. TU 4-1476.

BOAT: 14 ft. Sears Alum, w/ 7.5 hp Sears motor incl. tank, oars, anchor, line, $400. 587-0330.

HOUSE: Islip Village, 3 bdrm. ranch on treed ½ acre, exclusive Bayberry Point area south of Montauk Highway mod. kit., appl., lge. lvg. room, dng. area, den w/ fireplace, playroom w/ panelled cathedral ceiling, deck, 2 full baths, fully ndscpd., $45,000. 581-0333.

CHEV.: '65 Impala, 2 dr., hd. top, air cond., new tires, 283 engine, snows. Ask $450 or best offer. 286-0198.

For Sale

BICYCLE: 10 spd., man's "Favorite", full size, $60. SU 5-6289.

OLDS: '64 Jetstar, all power, r/h, bucket seats, snow tires, $350. After 6 p.m. 589-4595.

TV: 21 in. color Zenith, colonial console, 5 yrs., $250. 676-0967.

HOUSE: Lake Ronkonkoma, 4 bdrm. cape, fin. bsmt., eat-in-kit., Sachem school dist., $7500 cash take over mortg., $225 mo. 981-2829.

SKIS: 185 cm 6 ft. glas, size 9 lace boots, $55; tobaggan w/ cushion, $10. TU 8-1332.

NOVA: '68 SS, 350 cu. in. approx. 400 hp, 4 spd., Hurst competition plus/shifter, headers, gauges, vinyl roof, cam & kit., trantula intake manifold, $1700. 981-7245.

MERCURY: '71 Marquis, 4 dr. sedan, full power, tinted glass, air. cond. w/ climate control, $2495. Evgs. 249-1641.

RAMBLER: '61 Ambassador, auto., all power, needs work. PE 5-0161.

POOL FILTER: Sears best, diatamaceous earth, s/s tank, ¾ hp, morot, $100. 234-1923.

WASHER: GE, 14 lb., load cap., mini-basket, $50. 724-1857.

TV: Color, 18 in. port., 2 yrs., $175. 423-3596.

DINGHY: Sail 7 ft. skimmer w/ rudder, dagger, mast sail & oars, $175. 333-5119.

LEMANS: '72, 2 dr. hdtop, fac. air, vinyl, pow. steer, radio, positrac.. 11,000 mi., $3,100. 271-8371.

DEN SET: 5 pc., 2 gr. sofa, chr., table w/ lamp, $125. After 5 p.m. 269-6221.

VALIANT: '65 conv., V-8 arto., bucket seats, $400. After 5 p.m. 643-5019.

HOUSE: Huntington, 3 bdrm. colonial, school distr. 6, centr. a/c, all appl., $45,900. 261-0478.

HOUSE: Farmingdale Village, colonial, 3 bdrm., eat-in kitch., formal din. rm., front sun porch, OHW basebd. ht., screen, back patio, fin. basemt./rm., gar, nr. trans., school distr. 22, low tax, $34,500. CH 9-9313.

HOUSE: Huntington South, 10 rm. colonial, sch. distr. #13, fam. rm. w/firepl.. late spring occup., ask. $48,500. 549-5332.

HOUSE: Merritt Island, Fla., 5 rooms, 1 bath, 1 car gar.; also 1 bd. rm., mobile home, $17,000; Tony, Ext. 2858.

HOUSE: Cocoa, Fla., 5 rms., 1 bath, 2 car gar., zone for duplex, 100x118, $18,000. Tony, Ext. 2858.

HOUSE: Huntington ranch, ½ acre water view, 4 bdrm., 3 baths, liv. rm., din. rm., eat-in kitch., firepl., fin. basemt., 2 car gar., plaster walls. OHW, $61,000. 271-7909 (evngs.).

HOUSE: East Setauket, 3 bdrm., colonial bi-level, 1/3 acre wood., firepl., den, 4 appl., 1½ baths, gar., fenced, xtras. 473-1744.

PIANO: Upright, full keybd., $125. PI 1-7433.

FISH TANK: 5½ gal, plus stand, $15. WE 8-7501.

TELESCOPE: Dyna-scope, 4 inch reflect., 3 lens by Criterion, $60. 212-532-0295.

BDRM. SET: Blond mahogany, 9 pc., full bd., $175. MO 5-3129.

MOVIE SET: Bauer C1-M zoom lens camera, DeJur 888AZ proj., quartz light, carry. case, $200. AN 5-0399.

plane
GRUMMAN
news

Published twice a month for the employees of Grumman Aerospace Corporation, Bethpage, N. Y. 11714, as a function of the Public Affairs Dept., Vice President J. B. Rettaliata, director.

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'Switch off' orbiting observatory, end 4-year spectacular in space

After successfully completing more than four years of operation with 22,000 revolutions of the earth, the Orbiting Astronomical Observatory (OAO)—designed and built by Grumman—was turned off at 10:30 p.m. on February 13. Now silently circling the earth, the OAO has a record of one of the most comprehensive studies of the heavens ever undertaken.

Launched from Cape Kennedy on December 7, 1968, the OAO has literally flown and been controlled from the ground by engineers and scientists of NASA's Goddard Space Flight Center. NASA mission success criteria for the OAO was based on 30 days of operations while the craft itself had a design life of one year. It has far exceeded all expectations for the length of time of operation and the amount of data it returned to earth.

The two OAO experiments that have contributed the most significant information were the Smithsonian Astronomical Observatory (SAO) and the University of Wisconsin Experiment Package (WEP). The SAO experiment, known as Project Celescope, measured the brightness of some 50,000 main-sequence stars in the invisible ultraviolet portion of the spectrum and studies of the earth's outer atmosphere. The WEP was designed to provide data on the energy distribution of stars in the ultraviolet range, consisting of four eight-inch stellar photometers, two scanning spectrometers to augment the photometers, and a 16-inch nebular photometer capable of measuring the spectral intensity of star clouds.

Recent discovery

Astronomers have always been hindered by the shimmering veil of atmosphere that surrounds the earth. OAO, operating above this atmosphere, made it possible for the first time for astronomers to study the stars, planets, and other galactic phenomena for long periods of time unencumbered by the blurring effects of the atmosphere.

Among the most significant contributions of OAO to astronomy was the observation of a recently discovered massive hydrogen cloud, a million miles in diameter, surrounding the comet, Tago-Sato-Kosaka. OAO also provided the first detailed map of a significant portion of the celestial sphere in the ultraviolet regime.

Copernicus still flying

OAO's contribution to astronomy will not stop, however, with the turn-off of this satellite. Another OAO, launched August 21, 1972, code-named Copernicus, is returning more precise data than its predecessor. Many astronomers believe that together these OAOs have contributed more to astronomy in four short years than was collected in the period since Galileo first used the telescope in the 17th century.

Join co-op program. Vice President Jack Rettaliata (2nd R) and Wendell Bodden, administrator of Grumman's cooperative education program, chat with Dr. Stanley B. Klein (2nd L) and Carlos Parris (L) about C.W. Post College participation in co-op program. Parris will be first student from Post to work at Grumman under co-op plan. ((Photo by Marie Trimborn)

Navy going on tour with recruiting show

Hitting the road. New Recruitmobile is part of $874,000 Grumman contract. (Rendering by Craig Kavafes.)

If an "Uncle Sam Wants You" poster was an effective recruiting gimmick a few years ago, then the Navy today is planning to work a little harder. Reason: Grumman Health Systems has been awarded a $874,000 contract for 38 "Recruitmobiles," which means the Navy is literally planning to take its show on the road.

"The Recruitmobile business is a natural one for us," says Charlie Kirbow, director of the two-year-old department. "We are already an established manufacturer of specialized vehicles. Some of our units are now being used for efficient, curbside processing or treatment for such things as female cancer detection, health examinations and fraud investigations. So the specially equipped recruiting unit is merely a logical extension of our present line of vehicles."

Nationwide use

The Recruitmobiles will be used nationwide by the Navy for publicity and recruitment. They are approximately 21 feet long, nearly eight feet wide and more than nine feet in height. The interior has six-feet four-inches of headroom, a 15-foot-long interior working space and a self-contained power source.

The unit's interior appointments include: work desk with swing-top typewriter stowed below; two examination desks and chairs with moveable privacy curtains; two waiting couches; a removable table; brochure racks; a closet; a refrigerator; and a bathroom.

Visual presentations can be viewed either inside or outside the vehicle. A wall-mounted projector opposite a translucent screen enables recruiting movies or slides to be shown outside the vehicle to the public that will be protected from the weather by a roll-up awning. Inside the unit, visual presentations can be viewed on an overhead-mounted, pull-down screen in the forward part of the vehicle.

Each Recruitmobile will be manned by two Navy personnel. At full capacity a vehicle can comfortably accommodate up to seven potential recruits. The units will be made in lots of five with first delivery scheduled for May 12.

No singles allowed . . .

As you've probably noticed, we've switched our mailing procedure and now have the postal permit imprinted on the back page of Plane News. Just a reminder: it is a "bulk rate" permit and Plane News must be bundled and sent off in ZIP code bundles. The post office won't accept single Plane News any more. If you know of someone who should receive Plane News, send an AVO to our office in Plant 5.

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PERMIT NO. 264
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BETHPAGE, NEW YORK